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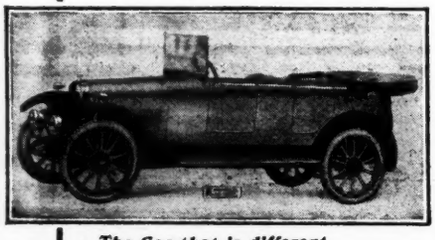

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Remarks
ON
HODGKIN'S DISEASE.*

BY
THE LATE SIR JAMES GALLOWAY, K.B.E., C.B., M.D.,
CONSULTING PHYSICIAN TO CHARING CROSS HOSPITAL.

[*With Special Plate.*]

ENLARGEMENT of visible lymphatic glands is a sign of disease quickly noticed by the sufferer and usually a cause of anxiety to him. In many cases it is also a cause of anxiety to the physician. It is true we are often able to reassure the patient—for instance, when it is recognized that the enlargement is due to septic infection within the lymphatic drainage system of the affected glands. Unless too far advanced, the cure of the original infective focus will cause the enlargement of the glands to disappear. In other cases we may be able to discover that the enlargement is due to a chronic infective process, such as tuberculosis, or to the occurrence of new growth, either primary or secondary in character. In such cases there is sufficient cause for alarm, but we have the advantage of understanding something of the nature of these enlargements and the satisfaction of knowing how much can be done and what should be avoided. But there are still other instances in which we are quite ignorant of the cause of the enlargement, but we do know the progressive nature of the disease. The most important example of this class is Hodgkin's disease. A recent writer has stated that this disease "presents the most hopeless condition in the whole domain of medicine." It cannot be denied that there is much truth in such a statement; it may, we trust, prove to be too emphatic. In this lecture I propose to draw your attention to certain manifestations of this disease in the hope of stimulating interest and investigation.

It is clear that the serious nature of the malady and the mystery of its occurrence must have made an impression on the mind of Dr. Thomas Hodgkin when he wrote his paper on "Some morbid appearances of the absorbent glands and spleen"[1] in the year 1832. In the series of cases he describes he saw and noted the association of prolonged illness with enlargement of the lymphatic glands and the formation of new tissue resembling the lymphatic glands in the spleen. It cannot be said that his observations are presented in a very attractive form. Hodgkin apparently did not proceed with his investigation of the subject, and the record of his discovery appears to have been almost forgotten. Dr. Richard Bright[2] referred to Hodgkin's cases in his description of certain abdominal tumours, but with this exception Hodgkin's observation seems to have been lost sight of until Sir Samuel Wilks[3] once more drew attention to the subject of "Enlargement of the lymphatic glands combined with a peculiar disease of the spleen" in 1856, and, recognizing the priority in discovery, spoke of "Hodgkin's disease." Wilks strangely had been in ignorance of Hodgkin's description during his earliest work on this subject, but at the end of his paper he writes: "It is only to be lamented that Dr. Hodgkin did not affix a distinct name to the disease, for by so doing I should not have experienced so long an ignorance—which I believe I share with many others—of a very remarkable class of cases, the recognition of which would have guided both myself and others to an explanation of some more recent cases coming under our notice." If Sir Samuel Wilks could now look back on the record of descriptions and investigations of this disease he would sympathize with the difficulty of affixing a "distinct name to the disease."

Since those days the disease has been carefully studied, using all the means at the disposal of modern investigation; its possible association with tuberculosis has been discussed—many have held that it is in reality an unusual manifestation of tuberculosis infection, an opinion probably now held by but few; the peculiar fever associated with the disease has been noted and looked upon as evidence that the disease is an unrecognized form of relapsing fever. Its relations to disorders of the blood, especially the varieties of leukaemia, have been investigated, and still we are unaware of the cause of the disease or its exact morbid relationships. The various synonyms which have been suggested are in some cases useful in laying stress on features of the malady; but it appears to me best still to adhere to the name of "Hodgkin's disease," especially as new "distinct names" do not take into account sufficiently the fact which becomes more evident—that we are dealing with a general specific disease associated with progressive infection of susceptible structures.

A very interesting chapter of medical bibliography could be written respecting Hodgkin's disease, especially if note were made of some of the distinguished writers.

The disease is so widely distributed, and its main features are now so well given in many textbooks, that it is unnecessary as well as inopportune for me to describe them in this place. I propose to illustrate points in its symptomatology, using for this purpose cases recently under my own observation. I think that the cases will support the conception of the malady which I have stated.

THE OCCURRENCE OF UNUSUAL PROTEIN IN THE URINE.

Apart from the complication produced by true nephritis, I believe that the occasional or temporary occurrence of albumin in the urine in small quantity is not uncommon in Hodgkin's disease, just as in many other chronic maladies, and is probably not of special significance; but the incident I am about to relate is in a different category. I have had recently under close observation, until the time of his death in Charing Cross Hospital, a case of the disease in a man. Early indications of the disease, such as enlargement of the cervical and inguinal glands, appear to have been noticed in the early part of 1919. He came under my close observation in 1920, and was then in fair health, although the nature of his malady was clear. In July, 1920, I examined his urine carefully; it had a specific gravity of 1.016, and contained no albumin and no sugar. I again saw him in the early part of 1921, when he told me that something unusual had happened; at night-time, he said, he was troubled by having to pass urine in large quantities, although during the daytime he was little disturbed in this way. On examining his urine on this occasion I found the specific gravity to be 1.014. On proceeding I saw the faintest possible cloud after acidulating the urine and heating. To my surprise this cloud disappeared on heating still further, and showed itself again on cooling. Treating the urine with picric acid saline I obtained a heavy flocculent precipitate estimated in an Esbach's tube to be about 14 parts per 1,000. It was now quite clear that the urine contained a protein of unusual character, and I suspected that it might be an example of "Bence-Jones albumin." Careful and repeated examinations showed that this peculiar protein was constantly present. It occurred in large quantities, varying from 1 to 2 up to 10 to 15 parts per 1,000 by Esbach's method. This peculiar protein remained present during the rest of his life; the symptom of polyuria gradually diminished, and in the later stages the amount of this protein present was considerably less than when first observed. Fortunately, when the patient had to be admitted to hospital I had the co-operation of my colleague Mr. Sydney W. Cole. The characters of the precipitate have been carefully investigated, both at Charing Cross Hospital and in the Biochemical Laboratory, Cambridge. I hope that Mr. Cole will publish shortly a full description of this unusual substance. In the meantime, by way of identification, I can give the following description sent to me by Mr. Cole:

The protein is similar to the "Bence-Jones albumin" in that it is coagulated on heating, redissolves on further heating, and reappears on cooling. It differs in several respects:

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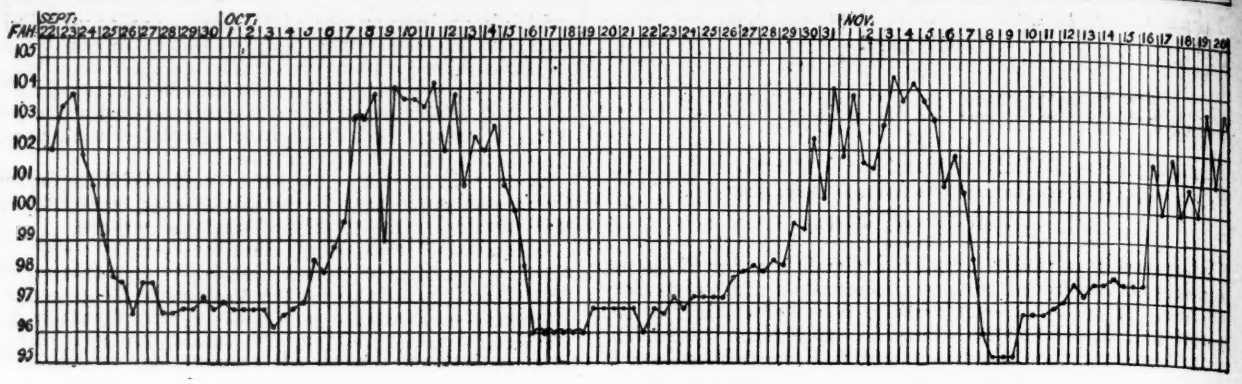
Difficult to coagulate.	Becomes quite insoluble if kept at 80° C. (in the presence of acid and salt) for some minutes.
Even when highly diluted exhibits a white ring of precipitate when poured upon strong HCl (Bradshaw's test).	Not precipitated by HCl under any conditions.

The new protein is best detected by noting the precipitate in the cold with sulpho-salicylic acid—the urine itself failing to give a

* Sir James Galloway, whose death on October 18th has been so great a loss to clinical medicine, left behind him notes he had prepared for a post-graduate lecture he was to have delivered before the Fellowship of Medicine and Post-graduate Medical Association on October 11th. They have been put in order by Sir William Hale-White and are here published. It is probable that Sir James Galloway would have made the lecture longer had he survived.



TEMPERATURE CHART.

heat coagulum under optimum conditions of reaction (that is, just acid to brom-cresol-purple). The new protein often separated in flocculi as the urine cooled.

Microscopic and other investigations of the urine were frequently carried out, and gave no evidence of true nephritis. The autopsy completely confirmed the diagnosis of the case. The kidneys were unusually affected; the capsules were greatly thickened, but stripped off easily. There were cysts in both kidneys; microscopical examination showed that the cortices of the kidneys contained small areas of the characteristic overgrowth of the disease.

THE FEVER OF HODGKIN'S DISEASE.

In all cases of this disease the body temperature is raised at some time. On looking over many temperature charts the occurrence of fever seems often to be irregular and comparatively mild in degree. But in a few cases the course of the temperature is extraordinarily regular, both in its exaggerations and in its relapses. In a characteristic case the chart is one of the most remarkable within medical knowledge.

The temperature of other cases, which appears at first sight to be irregular, on closer examination gives evidence of a definitely periodic course. The peculiar character of the temperature has attracted the attention of many observers; its occurrence was emphasized by Pel[4] of Amsterdam, and by Ebstein[5] of Göttingen, who described such cases as examples of an unusual type of relapsing fever.

I have recently had under my observation a patient whose temperature was a very perfect example of this relapsing type. I have a complete record of his body temperature during a period of five months preceding his death. After being nursed at home, and later in a private nursing home, he was admitted to Charing Cross Hospital under the care of my colleague Mr. Peter Daniel. I had therefore frequent opportunities of seeing the patient during the last two months of his life.

On examination little could be made out in the way of physical signs. None of the easily palpable lymphatic glands were enlarged, although I suspected that the retroperitoneal lymph glands might be. These, however, were not easily palpable. After death the glands extending along the whole of the left side of the lumbar vertebrae formed a large mass, the glands in the groin were also enlarged, and there were white nodules in the spleen.

During the relapses of the fever he was deeply unconscious, with low delirium, and resembled a severe case of typhoid fever about the third or fourth week. When the temperature remitted he recovered consciousness to a very marked degree and improved greatly in general appearance. But even in the afebrile periods the patient was obviously seriously ill.

On studying the temperature chart we observe that the fever is markedly relapsing in type; there are febrile periods of from five to eleven days in duration, succeeded by periods of pyrexia usually longer than the periods without fever. The pyrexial period in what may be regarded as atypical outbursts lasts for about twelve days; the cycle of the disease, reckoning from the commencement of the afebrile period to the end of the period of pyrexia, appears to be on the average about twenty days.

The rise of the body temperature is rapid, reaching an elevation from subnormal or normal to 104° or 105° in the course of forty-eight to sixty hours. This rapid rise was associated with a certain amount of shivering and other evidences of a febrile attack, especially with rapidly increasing and severe toxaemia. During the period of raised temperature the patient was almost unconscious, as if severely poisoned; he could, however, be roused to answer simple questions, but with great difficulty.

After the period of eleven or twelve days the fall of temperature took place, usually more rapidly than the rise. Thus a fall from 104° or 105° to subnormal ranges of 96° and 97° would occur within forty-eight hours. After four or five days of subnormal temperature the curve would again rise slowly towards the normal, then suddenly the upward curve would show itself, indicating the commencement of the period of relapse.

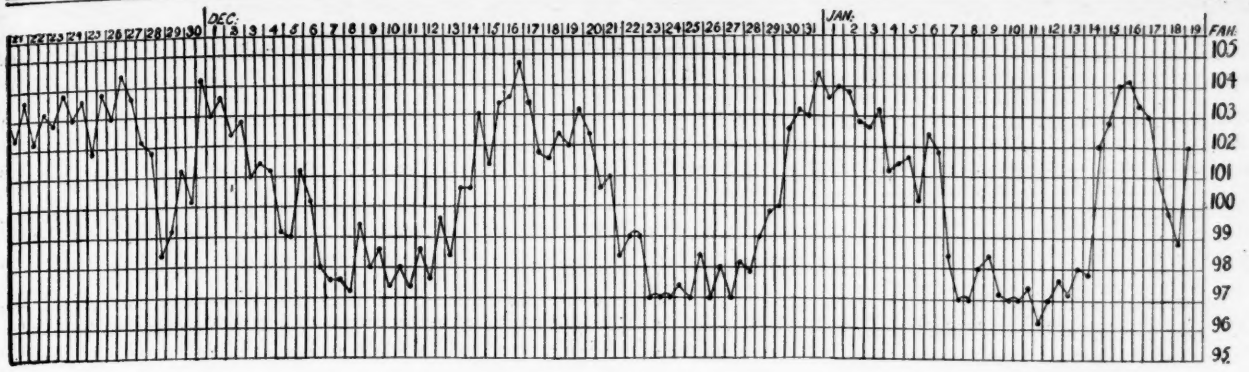
This temperature chart also suggests that two attacks of fever might succeed each other rapidly, so that there would be an unusually long pyrexial period of about twenty-one days, but during such a prolonged febrile attack definite remission of fever occurs, indicating the usual limit of a febrile period, succeeded immediately by a new access of fever. It was remarkable how rapidly the patient recovered consciousness when the temperature fell.

I have had this prolonged record of fever reduced from the four-hourly charts to a small scale of one-tenth of an inch to each observation (see Chart). As nearly as possible I have taken the temperature record of 8 o'clock in the morning and 8 o'clock in the evening as indicating the course of the fever. The reduction has brought about the appearance of exaggeration of the variations of temperature relatively to the time. Bearing this in mind the reduced chart demonstrates very well the peculiar relapsing nature and the severity of the fever. I owe to my friend Professor Arthur J. Hall[6] of Sheffield the suggestion of arranging such prolonged temperature curves in the way described. Professor Hall showed me a chart arranged in this manner in a similar case of prolonged Hodgkin's fever.

On examining such a temperature curve we get a strong impression that the disease characterized by this fever is caused by a specific poisoning; also that this poisoning is of infective and in all probability of parasitic nature; and further, that the periodicity of the temperature depends on some such event as the life cycle of a parasite. It is a facile suggestion to make—that the infective agent may be a protozoon. Unfortunately, as yet we have no definite evidence that a parasite is the cause of Hodgkin's disease.

THE CUTANEOUS SIGNS OF HODGKIN'S DISEASE.

Probably in all infections certain tissues are more susceptible to the morbid influence than others. This is very clearly the case in Hodgkin's disease. The lymphs glands and allied structures are peculiarly susceptible. It might at first be thought that as the skin does not contain obvious lymphoid structures, with the exception of the all-pervading lymphatic channels, it would not usually show signs of the malady, but the observation of patients teaches that the skin not unusually gives evidence of the disease. These manifestations fall into two categories. By far the most important is the appearance of small erythematous points or macules on the skin of the body and the extremities. Sometimes these become distinctly papular, raised a little above the surface; usually they disappear, leaving a faint staining of the skin. Very rarely these papular lesions become slightly vascular. In association with the enlargement of the lymphatic glands, the cutaneous condition closely resembles the severer forms of prurigo. As the result of these lesions, aggravated by friction and scratching, wide areas of the skin may become thickened and swollen, producing an exaggeration of the natural texture of the skin, emphasizing the folds and wrinkles, and



CONTINUATION OF TEMPERATURE CHART.

giving an elephantoid appearance. This condition of the skin closely corresponds in appearance with what has been named lymphodermia. Coexisting with the above state the surface of the skin may be dry in some cases, desquamating in fine scales, and very often showing widespread pigmentation of a pale yellow-brown colour. But the most important of all the cutaneous symptoms is pruritus. I believe that the misery experienced by the itching in some cases of Hodgkin's disease is unexampled in other maladies. It seems to occur very commonly in mild degree, bnt in those cases in which the papular lesions develop the itching is intense and most exhausting. Nothing seems to be able to control the desire to scratch and rub the affected skin. The patients scratch open the papules, and only then will they admit that they have a certain amount of relief. Anyone who has to deal with a severe case of Hodgkin's pruritus will not fail to remember the misery of the patient and the difficulties experienced in advising treatment.

The histological examination of the skin in such cases shows two sets of lesions. In the first there are the usual changes occurring in severe non-pyogenic dermatitis. Such changes might arise from the specific poison of the disease itself or as the result of absorption from the newly formed tissues of the disease. Secondly, in some cases the formation of new cells in the neighbourhood of the blood vessels and lymphatic channels seems to be of a special character and to resemble the characteristic overgrowth of the disease.

In addition to these generalized cutaneous conditions, which are not very uncommon, there occurs much more rarely the formation of small tumours and nodules in the skin. They are often numerous, small, up to the size of a broad bean, flattened rather than definitely raised from the surface, and pale pink or brownish in colour. The histological examination of these nodules shows that they are composed of the characteristic Hodgkin's "granuloma." These nodules may occur apart from the other indications which I have mentioned.

These cutaneous lesions are not only important in themselves, but they have a close resemblance to the skin manifestations of other diseases. The most striking of these is the distressing malady known as mycosis fungoides. Just as in Hodgkin's disease, mycosis fungoides seems to be caused by a general infection of the body. The cutaneous manifestations fall into two groups: a widespread inflammatory change in the skin, and the formation of tumours. The histology of the tumours closely resembles the histology of the granuloma in Hodgkin's disease, so much so that certain very competent observers have come to the conclusion that mycosis fungoides is but a special manifestation of Hodgkin's disease, affecting mainly the skin. It is very important as well as interesting to note that the cutaneous manifestations in the varieties of leukaemia also resemble in many of their features the conditions mentioned. There may occur a widespread pruriginous dermatitis on the one hand, and the formation of nodules composed of characteristic cellular elements on the other.

TREATMENT.

As we are yet ignorant of the cause of this disease, its treatment is unsatisfactory. There is still too much truth in the opinion that there is no recorded case of cure or recovery. There are, however, methods of alleviation.

Arsenic seems to be the only drug which has any beneficial influence. A considerable amount of evidence shows that the drug is of value, at any rate in certain cases. It has been used in various ways—by the mouth, subcutaneously, and, since the introduction of the salvarsan group of preparations, by intravenous injection. I have used the drug in a considerable series of cases, and have come to the conclusion that benefit is most conveniently obtained by its administration in the form of sodium cacodylate. The plan I usually follow is to prescribe the cacodylate in quarter-grain doses by the mouth, repeated during the day till as much as a grain or a grain and a half is administered daily. The patients bear this preparation well, with little intestinal discomfort. It is usually an indication to stop administering the drug, temporarily, when the characteristic garlic-like odour can be appreciated on approaching the patient closely. As a result of the administration of the drug, I believe that I have seen the glands diminish in size and the patients become more comfortable. A point of some interest has to be borne in mind. It appears that in some of the cases who have developed the characteristic pruritus of the disease, arsenic, at any rate after a time, seems to increase the pruritus. On stopping the drug I have known the pruritus diminish in degree.

A second method of treatment of undoubted value in certain cases of the disease is the use of *x* rays. The most distressing and dangerous complications of the disease occur when the glands within the thorax are affected. They may increase in size, producing at first discomfort, then symptoms of serious dyspnoea with stridor, owing to the pressure of the tumours on the trachea, bronchi, and other structures. A good many cases are now on record showing that the careful use of *x* rays in such cases of mediastinal Hodgkin's disease has brought about a great improvement in the symptoms and much comfort to the patient. Not only so, but repeated *x*-ray examination of the chest in these cases shows very clearly that, at any rate, the shadow produced by the tumour is greatly shrunken, no doubt owing to diminution in size of the glandular masses.

I have under observation at the present time a lady who was brought to me with clear evidences of Hodgkin's disease. There were enlarged glands in the axilla and in other parts of the body, but the main seat of the disease seemed to be those in the right side in the mediastinum. The patient suffered from dyspnoea with severe exacerbations and much stridor, so that her life was in immediate danger. She was treated by my late colleague Dr. Ironside Bruce, more than two years ago, with very satisfactory results. The patient improved, the dyspnoea and other discomforts almost disappeared, and she was able again to undertake her duties in her house. More than a year after a recurrence of the symptoms took place and she was once more treated by Mr. Stanley Melville. The favourable results, with relief of the symptoms, once more occurred. The patient after two and a half years still remains free of her symptoms and is able to carry on her duties. (See Figs. 1 and 2.)

In this case an enlarged gland was removed from the right axilla and shows the characteristic histological structure of the disease. I am glad to be able to demonstrate the *x*-ray photographs in this case, before and after treatment, and I have also had the advantage of comparing with these the *x*-ray photographs in a very similar case with similar results treated by my colleague Dr. Russell Reynolds.

There is one observation I should like to make with respect to *x*-ray treatment of this disease—the lesson was strongly impressed upon me when treating some cases with the help of my late colleague Dr. Ironside Bruce. It seems to be possible in certain cases, and apparently when too rapid resolution of the lymphoid masses takes place under *x* rays,

that very severe reactions with serious rise of temperature and other untoward results may follow the *x*-ray exposures. This phenomenon suggests that alien protein poisoning occurs as the result of the breaking down and absorption of the newly formed cells. It must, however, be stated that the tumours of Hodgkin's disease do not always diminish under *x* rays. In some cases the application has little or no beneficial effect; it is possible that in these cases much fibrous change has taken place in the glands, so that little beneficial effect from *x* rays can be expected.

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NINETIETH ANNUAL MEETING

OF THE

British Medical Association.

Held at Glasgow, July, 1922.

PROCEEDINGS OF SECTIONS.

SECTION OF SURGERY.

Professor H. ALEXIS THOMSON, C.M.G., M.D.Edin., F.R.C.S., President.

DISCUSSION ON SURGICAL TREATMENT OF NON-TRAUMATIC AFFECTIONS OF THE SPLEEN.

OPENING PAPERS.

I.—JAMES CARSLAW, M.A., M.B.,

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IT has long been known that the spleen is not essential to life. Even in the sixteenth and seventeenth centuries there were cases of successful removal of spleens that protruded through wounds of the left side, and by the end of the seventeenth century experiments on the spleen began to be done on animals. It was gradually established that the spleen could be done without, and that after its removal certain compensatory changes occurred in the lymph tissue of the liver and in the lymphatic glands. Thus the way was paved for the deliberate removal of the spleen in man in conditions in which it was enlarged by disease. However, it has been only in the last few years that any clear indications for this operation have been established, great assistance in this matter being got from the systematic examination of the blood. At first unsuitable cases were chosen—notably some advanced cases of leukaemia—and the mortality was so alarming that the operation was reserved almost entirely for cases of injury. But the technique of splenectomy now presents no serious difficulty and in such suitable conditions as splenic anaemia and acholuric jaundice the mortality, according to recent statistics like those of the Mayo Clinic, is less than 10 per cent., and in a large proportion of the successful cases the patients may be considered as cured.

In considering this subject generally one is straight away confronted with one's ignorance as to what the real functions of the spleen are. A large literature has grown up on this subject, and much experimental work has been done, an excellent summary and discussion of which will be found in Sir Berkeley Moynihan's book on the spleen,[1] which has a very full bibliography. This will be my excuse for making but few detailed references to the literature. A difficulty that meets one in studying all this work is the difficulty of reconciling the results of many of the experiments on animals with the clinical findings in the human subject. I shall therefore only mention some of the more outstanding and agreed upon conclusions. The spleen has no doubt *some* relation both to the formation and the destruction of blood cells. Blood cells are probably not formed by the spleen except in embryonic life. But it may be that some internal secretion of the spleen influences the bone marrow, which is *the* blood-forming tissue of the body, stimulating the formation of red cells and perhaps inhibiting that of the white cells. On the other hand, the evidence of blood destruction in the spleen is quite strong, and no doubt it is this organ which is most concerned in the destruction of the used-up red cells and in passing on the products of these cells to the liver for the formation of bilirubin, etc. To a lesser extent the liver in health shares in this work. In certain diseased conditions this haemolysis is exaggerated, and this is what mainly explains the anaemia and in some cases the jaundice that occur. It is the removal of this destructive process that is in most cases the principal indication for splenectomy. When the spleen has been removed by operation no doubt the liver and perhaps also the lymphatic glands take over its former duties.

There is little doubt also that the spleen exercises important phagocytic functions in regard to the micro-organisms of many infectious diseases. This has something to do with the enlargement of spleen that occurs in most of the infections and in septicaemic conditions generally, also in such diseases as malaria, kala-azar, and syphilis. In this connexion the experiments of Morris and Bullock[2] on rats are especially interesting, showing that splenectomized rats are less resistant to various infections than the normal controls, but I do not think this has been confirmed in the human subject.

There are many diseases in which splenomegaly occurs. It is a feature in varying degrees, often of diagnostic importance, of the infective fevers and septicaemia, and also in the protozoal infections, in all of which one may say no call for surgical measures need arise. Then there are a number of blood diseases of great interest, in which the cause, probably an infective one, is not known. In some of these the splenic enlargement may be taken to be a part only of a general condition arising elsewhere, and in such cases any operation on the spleen is uncalled for or at least is a doubtful question. Pernicious anaemia may here be mentioned, and although many advocate splenectomy in this disease, even without splenic enlargement, and large numbers of successful splenectomies have been performed, it is generally agreed even by surgeons that the illness goes on and that the ultimate result is no more satisfactory than that attained by medicinal remedies.

Another obscure disease which in chronic cases gives rise often to very large spleens is leukaemia, and in spite of the advocacy of the Mayo Clinic I cannot agree that the spleen should be excised in such cases. This disease is principally one of the bone marrow, some infective agent causing great overaction of the white cell producing marrow and throwing into the circulation hosts of actively proliferating cells, which multiply in the lymph structures of the body generally and particularly in the spleen. Removal of the spleen in such cases is only dealing with a small part of the trouble, and that not causal. Erythraemia or Vaquez's disease is somewhat analogous, being the result of an overactivity of the red cell producing marrow, and although the spleen does enlarge in this disease this is probably the result of overwork of the spleen in red cell destruction and of the nature of a compensatory hypertrophy. The inference to be drawn from this would be that in Vaquez's disease the last thing to do would be to remove the spleen. I might also mention Hodgkin's disease here as one in which the enlargement of the spleen is only a part of a general hypertrophy of lymphoid tissues, usually most marked in groups of lymphatic glands.

But there are two groups of cases where the disease, probably a toxic agent of some kind, seems to be centred in the spleen, and it is in these that the successes of splenectomy are got. There are the splenic anaemias and certain cases of acholuric jaundice (some hereditary and some acquired) that have been classified during the last twenty years or so. I may here suggest that splenic anaemia (and I would use the term "Banti's disease" as synonymous) is probably not an entity. Cases usually become grouped under that heading by a process of exclusion and are found by the pathologists to present quite a variety of changes. There is still much work, clinical and pathological, to be done before the splenomegalies of this group are satisfactorily classified.

I would like to refer to some cases which have been treated in some of the wards of the Western Infirmary, Glasgow, in the last few years and to make some observations based on these cases.

CASE I.

S. R., a young girl of 8, was admitted to the Western Infirmary on July 26th, 1912, under the care of Dr. John S. McKendrick, and an account of this case was published in the *Practitioner* (November, 1914).[3] She gave a history of ill health for four years with increasing anaemia, and latterly haemorrhages into skin and retinae. There

was nothing of note in the family history. There was no enlargement of lymphatic glands, slight enlargement of liver, and the spleen reached nearly to the umbilicus. Wassermann test was negative. Examination of the blood gave the following result:

Blood Examination.

Date.	R.B.C.	W.B.C.	Hb.	C.I.
July 27th, 1912	2,550,000	7,800	25%	0.5
August 5th, 1912	2,700,000	11,400	25%	0.46
August 28th, 1912	Splenectomy			
August 29th, 1912	4,650,000	34,800	35%	0.38
September 4th, 1912 ...	4,170,000	12,500	35%	0.4
November 12th, 1912 ...	4,890,000	12,000	70%	0.7

Blood films before operation showed more small lymphocytes than usual, but immediately after operation there was a very marked polymorphonuclear leucocytosis. As medicinal treatment was disappointing her spleen was removed by Dr. Alexander MacLennan on August 28th, the patient making an uninterrupted recovery. A small portion of a rib had been previously excised and found to be hyperplastic.

The pathological report by Dr. (now Professor) Shaw Dunn described the spleen, which weighed 4½ oz. (about twice the normal for patient's age), as of firm consistence and congested, with enlargement of the lymph nodes. The main departure from the normal in films from the spleen was the presence of normoblasts and myelocytes and an unusual number of polymorphs and eosinophile leucocytes.

The patient left hospital well in November, 1912, and I am able to report that she is still alive and well. I had a letter from her mother this month in which she says that the girl, who is now a tall young woman of 18, has had no serious illness since her operation. She has, however, always been rather pale and has not yet begun to menstruate. This appears to be a case of splenic anaemia and resembles Case VI in many respects.

CASE II.

E. S., a poorly developed youth of 17, was admitted to the Western Infirmary on March 13th, 1915, complaining of swelling of the abdomen of three or four months' duration, and later also of swelling of the feet. He was under the care of Professor T. K. Monro, who has asked me to record this case and also Case IV. The patient was anaemic-looking, and his gums were soft and bled easily. He had slight enlargement of glands on both sides of his neck. The hepatic dullness was small, but the spleen was much enlarged and reached to 2½ inches below the level of the umbilicus. The Wassermann test was negative. Examination of the blood gave the following result:

Blood Examination.

Date.	R.B.C.	W.B.C.	Hb.	C.I.
March 19th, 1915	4,440,000	3,000	62%	0.7
April 25th, 1915	4,696,000	4,200	70%	0.7
April 27th, 1915	Splenectomy			
May 2nd, 1915	5,235,000	10,600	85%	0.8
June 25th, 1915	4,310,000	7,800	80%	0.9

Blood films showed nothing abnormal. The fragility of the red cells was normal, but the coagulation time was a little slow (7 minutes). As medical treatment was disappointing, splenectomy was performed by Sir Kennedy Dalziel on April 27th. The spleen had extensive adhesions from perisplenitis, and at the operation some cystic condition of the liver was noticed, but the kidneys appeared to be normal. He recovered well from the operation and left hospital at the end of May, apparently improved. But the tendency to haemorrhage continued, and a year later, in June, 1916, he died after three days' serious illness, having apparently had an intracranial haemorrhage.

What the nature of this case was it would be difficult to say precisely. I have not been able to trace a pathological report on his spleen. Another point of interest is that although the surgeon might consider this a successful case from the operation point of view, the ultimate result was unsatisfactory. It illustrates the fallacy attached to the statistics of recovery in these cases, but I may say it is so far the only failure among the cases to which I am referring.

CASE III.

Mrs. S., aged 33, was admitted to the Western Infirmary, to Dr. Wm. MacLennan's wards, on November 26th, 1914. She had had a cystic ovary removed in January, 1913, and was noticed then to have an enlarged spleen. In 1914 she had two miscarriages. She was a sister of Case IV, but otherwise the family history was negative. The patient was thin and pale but slightly jaundiced, though no bile was present in her urine. There was no enlargement of glands or liver, but spleen reached 2½ inches across the middle line and 3½ inches below the level of the umbilicus. Wassermann test was negative. Examination of the blood gave the following result:

Blood Examination.

Date.	R.B.C.	W.B.C.	Hb.	C.I.
February 2nd, 1915 ...	2,500,000	6,000	40%	0.8
February 10th, 1915 ...	Splenectomy			
March 2nd, 1915	4,600,000	9,800	62%	0.6
May 19th, 1915	6,435,000	10,400	75%	0.6

Blood films showed nothing abnormal about the white cells, but increased fragility of red cells was demonstrated, beginning in her case with 0.6 per cent. salt solution. The spleen was removed by Dr. Cuthbert on February 10th, and she made a rapid recovery, leaving hospital on March 19th very well. I heard of her within the last few days and am able to say that she has enjoyed excellent health since her operation and has a child 2 or 3 years of age.

Dr. Haswell Wilson's report on the spleen is as follows: "The pulp shows general hyperplasia with great congestion of sinuses. No phagocytosis of red cells is seen, nor is there any other particular change. Some of the Malpighian bodies are rather fibrous and atrophied."

This case and that of her sister (Case IV) were clearly acholuric jaundice. Both of them had large spleens, were jaundiced, showed fragility of red cells, and in both the symptoms developed in adult life.

CASE IV.

Mrs. N., aged 36, was admitted to the Western Infirmary, under Professor T. K. Monro, on November 19th, 1914, complaining of weakness, fullness of the left side, and recurring attacks of jaundice, all of one year's duration. There was a story of biliary colic, but she had had some attacks of severe pain in the left side—presumably perisplenitis. She had no children, and the family history was negative except for the illness of her sister (Case III). The patient was slightly jaundiced, though no bile was found in the urine. There were no enlarged glands and no enlargement of the liver, but spleen was easily felt reaching to the middle line and half an inch below the level of the umbilicus. Wassermann test was negative. Some of the blood counts are given here:

Blood Examination.

Date.	R.B.C.	W.B.C.	Hb.	C.I.
November 20th, 1914 ...	4,255,000	19,600	60%	0.7
January 9th, 1915	2,300,000		38%	0.8
November 2nd, 1915 ...	4,000,000	18,000	62%	0.7
November 3rd, 1915 ...	Splenectomy			
November 8th, 1915 ...	4,250,000	14,000	68%	0.8
November 27th, 1915 ...	3,910,000	11,400	74%	0.9
October 11th, 1916... ...	3,800,000	10,937	72%	0.9

The fragility of the red cells was markedly increased, beginning in this case with 0.7 per cent. salt solution, but nothing abnormal was found in regard to the white cells. She was at first in hospital for seven weeks, getting arsenic and iron medicines, but seemed to get worse, and went home at her own request on January 12th. However, she returned to the same ward in October, 1915, with her blood a good deal better, but jaundice and spleen as before. She now demanded to have her spleen removed, because of the great success of her sister's operation. Sir Kennedy Dalziel operated on November 3rd, the spleen being found to be much enlarged and having many adhesions to stomach, liver, and abdominal wall. The appendix was normal, but gall stones were noticed in her gall bladder. There were signs of chronic peritonitis. She made an excellent recovery from her operation, and went home at the end of November, being reported in January, 1916, to be wonderfully better, and quite free from jaundice.

Mrs. N.'s after-history is interesting, especially in connexion with the suggestion that removal of spleen may leave the patient less resistant to other illnesses. In September, 1916, she began to complain of swelling of the abdomen, and was readmitted to the Western Infirmary in October, 1916, with ascites. On November 14th Sir Kennedy Dalziel opened her abdomen and drained the ascites, which was demonstrated to be due to tuberculous peritonitis. From this she made an excellent recovery, but her troubles were not over. In 1917 she began to have great pain, and menstruation with excessive discharge, and ultimately this was found to be due to a submucous fibroid of the uterus. In the spring of 1918 this was removed by Dr. S. G. Cameron by the vaginal route, and in 1919 a second similar fibroid had to be removed. After that she returned to good health, and is now really very well, though not quite so robust as her sister.

CASE V.

C. P., a female school teacher of 26, was admitted to the Western Infirmary, to Dr. William MacLennan's wards, on October 1st, 1918, complaining of enlargement of spleen, which had been first

noticed two months before. The family history was negative. She was sallow and anaemic and had a short dry cough, though nothing abnormal was detected in her lungs at this time. There were no enlarged glands and no enlargement of liver, but spleen was easily palpated, reaching 1 inch to the right and 2 inches below the umbilicus. Wassermann test was negative. She improved greatly under treatment with arsenic and intramuscular injections of galyl and left hospital in January, 1919. However, she was readmitted under my care in August, 1919, with the same symptoms, the spleen still reaching to the umbilicus. She again improved greatly under arsenic and galyl, though spleen remained as before, and was giving so much discomfort by its weight and interfering so much with her stomach that on dismissal in December she was recommended to wear an abdominal support. As in spite of a good holiday she was feeling quite unfit for work she returned to hospital on February 5th, 1920, and in connexion with a troublesome cough, which she still had, I detected something wrong with the apex of her right lung, although she had no spit. After a time she consented to have her spleen removed, and Sir Kennedy Dalziel operated on April 28th, 1920; there was some difficulty in the operation owing to the size of the spleen and the presence of adhesions. There was no sign of tuberculous peritonitis. However, she lost practically no blood, and made an excellent recovery from the operation, while the ultimate result has been very good. She resumed her full work as a teacher in August, 1921. Menstruation, which had been absent for a long time, returned, and when seen by me in March last she looked perfectly well.

Some of her blood counts are as follows:

Blood Examination.

Date.	R.B.C.	W.B.C.	Hb.	C.I.
October 2nd, 1918	2,400,000	4,800	45%	0.9
October 19th, 1919... ...	3,576,000	4,200	60%	0.8
April 20th, 1920	3,400,000	3,400	55%	0.8
April 28th, 1920	Splenectomy			
June 8th, 1920	4,560,000	5,000	60%	0.6
March 11th, 1922	4,200,000	9,600	80%	0.9

Blood films in this case never gave nucleated red cells, but a leucopenia with slight excess of lymphocytes.

Professor Muir's report on this spleen is as follows: "The spleen is enormously enlarged, the weight being 5 lb. The surface shows numerous slight elevations, and through the capsule small irregular pale patches can be seen. The form of the organ is maintained and its consistence is firm. On section the whole organ is seen to be studded with numerous tubercle-like nodules, which stand out against a congested background. The nodules are of about the size of a large pin's head, of greyish colour, and arranged in closely packed clusters, in many places confluent. They are, on the whole, remarkably uniform in size throughout the organ, though one or two larger nodules are present. On microscopic examination the nodules have all the characters of somewhat chronic tubercle nodules. Caseation is present in the central parts and there are numerous giant cells of usual appearance. There is also a considerable amount of interstitial fibrosis. In spite of very prolonged search no tubercle bacilli could be found."

This appears to be a case of tuberculosis of the spleen, and it seems to be most remarkable that such a condition should be possible in a vascular organ like the spleen without general tuberculosis resulting. Splenectomy seems to have resulted in complete cure, and a very similar successful case is reported by H. Z. Giffen.[4] One of the cases reported in the *Journal of Pathology and Bacteriology* by Dr. Kettle is of the same nature.[5]

CASE VI.

S. W., a young girl of 17, was admitted to my wards in the Western Infirmary on February 1st, 1922, complaining of general weakness of at least ten years' duration, with enlargement of the spleen. She had been under Dr. Frank Charteris as an outdoor patient at the Western Infirmary Dispensary in 1916, and as she did not improve on ordinary blood tonics she was admitted to hospital, to Professor Stockman's wards, in September of that year. She was treated intravenously with tartar emetic, and seemed to improve, but the improvement was not lasting, and she continued in the same anaemic and enfeebled condition until she came back to hospital this spring. She was not only anaemic-looking, but was poorly developed for her age, and had not yet begun to menstruate. The family history was negative. There was no enlargement of glands or of liver, and spleen was moderately enlarged, reaching half-way to the umbilicus. Examination of the blood gave the following result:

Blood Examination.

Date.	R.B.C.	W.B.C.	Hb.	C.I.
February 16th, 1922 ...	2,900,000	5,600	50%	0.9
March 1st, 1922	Splenectomy			
March 10th, 1922	3,000,000	9,400	50%	0.8
April 13th, 1922	4,760,000	8,600	70%	0.7
May 18th, 1922	4,950,000	7,500	90%	0.9

A blood film showed "marked variation in size and shape of the red cells, some being of megalocytic type. Polychromatophilia and punctate basophilia were well marked, more especially the former. One normoblast was seen during the whole examination. No characteristic abnormality was noted in the leucocytes."

As she was making no improvement on medicinal treatment and seemed to be in danger of becoming a chronic invalid and to be likely to be exposed to the danger of serious haemorrhage, which is common in such cases and often fatal, splenectomy was recommended, and Sir Kennedy Dalziel operated on March 1st. There were no adhesions and the operation presented no difficulties, the patient making a rapid recovery. It was interesting to watch the rapid improvement in the girl's appearance within a few days of operation. When she went home in May after a few weeks at the convalescent home she looked the picture of health. I may mention that intentionally after the operation she was given no arsenic or iron, and that makes the remarkable improvement in her blood counts all the more striking.

Professor Muir's report: "The spleen is uniformly enlarged and its surface smooth; weight 2 lb. 2 oz. Its consistence is moderately firm and on section the pulp shows a uniform dark red colour due to engorgement of blood. The Malpighian bodies are somewhat enlarged and stand out very distinctly against the congested background. Films were made from scrapings of the pulp and stained in various ways. The cells, relatively scanty in proportion to the blood, are chiefly lymphocytes and mononuclears, with a few polymorphs. No abnormal cells, no evidence of phagocytosis, and no accumulation of pigment are found. Sections show a general increase of the lymphoid tissue; the Malpighian bodies are large and the germ centres very distinct. There is marked congestion of the pulp and there is some evidence of thickening of the stroma at places, but this is at quite an early stage. Scarcely any blood pigment can be found, only a few granules of haemosiderin in the pulp on treating with HCl and potassium ferrocyanide."

Clinically and pathologically this case is very like Case I, and the result seems to be equally promising. In contrast I might mention the case of a young soldier of 20 whom I had as a patient in Stobhill (the 3rd Scottish General Hospital) in 1917. He was admitted as a gastric ulcer with haematemesis but was really splenic anaemia. He had had a serious haemorrhage from stomach at the age of 15 and he died from gastric haemorrhage seven months after my invaliding him out of the army. I have no doubt his life might have been saved if he had been operated on.

CASE VII.

Mrs. A., aged 35, was admitted to the Western Infirmary under my care on February 28th, 1922, complaining of weakness. This condition of ill health commenced about seven years ago and she had also suffered from cough and spit. In October last she got much worse and was actually admitted to the Tuberculosis Department of Ruchill Fever Hospital as a case of phthisis. Repeated examinations of sputum for tubercle bacilli, however, gave negative results, and she was found to have anaemia with splenic enlargement and was treated with arsenic. Ultimately she was discharged as non-tuberculous and came to the Western. Her family history was negative. She had had one pregnancy, the child being stillborn. The Wassermann test was negative. The patient was anaemic. There were no enlarged glands. The liver was palpable and the spleen moderately enlarged. She had a cough and mucopurulent spit with some pulmonary changes not specially suggestive of tubercle. Blood examination gave the following result:

Blood Examination.

Date.	R.B.C.	W.B.C.	Hb.	C.I.
March 15th, 1922	2,300,000	3,840	55%	1.2
April 4th, 1922	2,160,000	4,875	58%	1.3
April 21st, 1922	2,330,000	4,000	58%	1.2
May 5th, 1922	Splenectomy			
May 8th, 1922	2,200,000	16,000	58%	1.3
May 24th, 1922	3,100,000	4,600	65%	1.0
June 15th, 1922	3,400,000	7,200	68%	1.0
July 5th, 1922	3,040,000	6,600	65%	1.0

The pathologist's report on blood films was: "The red blood cells show marked variation in size and shape, and megalocytic forms are numerous, nucleated reds, several of which are megaloblasts, are found. The red cells are deeply coloured and polydermatophilic and punctate basophilia are common. No characteristic abnormality of white cells is present. The blood picture is that of an anaemia of the pernicious type."

As her progress under arsenic was rather disappointing, and the outlook far from promising, I recommended that her spleen should be excised while her general condition was still comparatively good. The operation was performed on May 5th by Sir Kennedy Dalziel, and no peritonitis was found. She was very little upset by the operation. From the date of operation for two months she was given no arsenic or iron, and in spite of this there was a steady improvement in the blood counts. Thus the red cells improved from a little over 2,000,000 to over 3,500,000, and the haemoglobin from about 50 to 65 per cent. The colour index was always high, and after operation as before films showed characteristic alterations in the red cells. The blood chart in this case, as in some of the others, shows a marked post-operative

leucocytosis, the significance of which is doubtful. I am inclined to think that it is not more than one might expect after any operative interference of comparable magnitude. She has recently been put on arsenic and iron medicines, and is still under treatment in my wards.

Professor Muir's report on this patient's spleen is as follows: "The spleen is moderately enlarged; the weight is 14 oz. It is smooth on the surface with the exception of a few adhesions. It is of moderate consistence, contains much blood, and has a uniform appearance on section. The Malpighian bodies are not enlarged. The general appearance is that of a congested spleen. In films made directly from the pulp most of the cells are lymphocytes, small and large, but there are also a fair proportion of neutrophil myelocytes and polymorphs, also a considerable number of eosinophils, some being of the myelocyte type. Nucleated red corpuscles also are present, some of which are megaloblasts. No large phagocytic cells and no blood pigment were found. In sections there is little of an abnormal nature to be made out. The pulp is congested, but the proportion of cells of the leucocyte class is greater than in the previous case (Case VI). The Malpighian bodies are distinct but not abnormal in size. There is practically no fibrosis, and there are no signs of blood destruction; practically no haemosiderin is present."

It will be interesting to watch the progress of this case. She has stood the operation very well and has much improved both in general condition and in regard to her chest condition. Instead of any deterioration of blood after operation such as is described in the case of animals there has been a fair and steady improvement even without medicines. Whether that improvement will be maintained and whether any more permanent good will result in her case than would have come with medicinal measures alone is the question. Certainly the operation does not seem to have done her any harm, but I must say I would not have recommended it unless the spleen had been enlarged. The great variation that occurs in the size of the spleen in this disease, and the acknowledged fact that splenectomy may relieve but does not cure it, show that the cause of the disease depends only in part on excessive haemolysis of red cells by the spleen. Professor Muir's report is interesting from that point of view, no definite signs of blood destruction being found in the spleen.

CASE VIII.

J. C., a tailor, aged 36, was admitted to my wards in the Western Infirmary on June 21st, 1921, with swelling of the abdomen and general weakness. These symptoms were said to have started only six weeks before, and at that time enlargement of the spleen was detected. His previous health has been good except that he had had his left lower limb amputated high in the thigh at the age of 13 for osteomyelitis. The patient looked very anaemic. The spleen reached nearly to the umbilicus and ascites was present. The liver was not palpable and there were no enlarged glands. Wassermann test was negative. His blood examination last summer gave the following result:

Blood Examination.

Date.	R.B.C.	W.B.C.	Hb.	C.I.
June 21st, 1921	3,600,000	10,800	36%	0.5
July 4th, 1921	3,784,000	8,400	43%	0.56
July 16th, 1921	3,312,000	6,250	36%	0.5
August 2 st, 1921	4,420,000	5,650	52%	0.6

Blood films showed nothing abnormal. He was treated with arsenic and iron and his abdomen was tapped on July 22nd. He improved so much after the paracentesis that he refused operation at this time and went home, with his spleen, however, much the same. He was able to return to work after a time and kept fairly well till the end of April, when he had an attack of diarrhoea and with this the ascites returned badly. He was readmitted to hospital on June 28th, 1922, into the same ward. On readmission his anaemia was much worse than the previous summer and the ascites was very marked. On July 10th I drew off eleven pints of fluid, but it has rapidly returned. The spleen is no bigger than before, but after the paracentesis the liver was palpable at the left costal margin, the upper border of hepatic dullness being at the fifth rib. Blood examination on present admission gives the following result:

Blood Examination.

Date.	R.B.C.	W.B.C.	Hb.	C.I.
June 29th, 1922	1,635,000	8,600	28%	0.8
July 9th, 1922	2,300,000	4,600	30%	0.6
July 13th, 1922	2,848,000	15,700	30%	0.5
July 21st, 1922	2,580,000	4,200	30%	0.6

An interesting point about this patient's blood is that the fragility of his red cells is increased, commencing at 0.55 per cent. saline solution. This test was kindly done for me by Dr. Adam Patrick. It is usually stated that such fragility is a sign of acholuric jaundice and is never got in splenic anaemia (Banti's disease). But on neither of his residences in hospital has this patient had jaundice, and his blood serum was tested by me for bilirubin by van den Bergh's method and found to be free. That suggests that the fragility test is not pathognomonic.

I regard this case as an advanced one of splenic anaemia, in which some cirrhosis of the liver has supervened, and we are at present treating the patient with arsenic and iron to improve his blood condition before submitting him to splenectomy. The patient is willing to have that operation, and Sir Kennedy Dalziel has agreed to undertake it.* A considerable number of successful cases have now been reported of splenectomy even in this advanced condition. H. B. Sweetser[6] has reported a remarkable case, and W. J. Mayo[7] has described a number of cases of splenic anaemia complicated by cirrhosis of the liver in which he operated, in five of which ascites completely disappeared after splenectomy.

These cases illustrate a considerable variety of pathological conditions. The mere finding of splenomegaly is not an excuse for operation. I would rule out interference in such diseases as malaria and syphilis, although trauma of the spleen in the subject of malaria may necessitate operation, and such a spleen has been repeatedly removed with success. I would discourage operation also in leukaemia and in Hodgkin's disease. In pernicious anaemia I am not convinced that operation is called for; certainly not if the spleen is small. It may be that there are various types of pernicious anaemia and that some of them are more suitable for operation than others. But in splenic anaemia, if the patient's health and development are chronically poor, if repeated attacks of splenic pain occur, if from its size the spleen is distressing, and above all if the danger of haemorrhage seems to have supervened, I have no doubt the spleen should be removed, and that without waiting too long. For if the disease is allowed to advance to the later stage when cirrhosis of liver and perhaps ascites have developed not only is the operation more difficult but the chances of ultimate success are lessened owing to the changes in the liver. The greatest successes of splenectomy seem to have been achieved in cases of acholuric jaundice, like Cases III and IV of my series. There are, however, mild cases of this disease which may not require operation. But if haemolysis is extreme and the patient's condition deteriorating the operation should be recommended, and splenectomy has been found to bring about complete and permanent cure. In all cases one must be prepared for unexpected results from the pathological examination of the spleens after operation and my most striking example of that is the case of tuberculous spleen (Case V).

I would like to thank Sir Kennedy Dalziel for his keen interest in and skilful surgical treatment of my personal cases, and Professor Muir for the trouble he has taken in reporting on the pathological findings.

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II.—E. H. KETTLE, M.D.,

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SPLENOMEGALY is a comparatively common condition, and is a more or less prominent feature in the pathology of a variety of diseases. Often it is merely incidental and of quite secondary importance. In typhoid fever, for example, or in infective endocarditis, the enlargement of the spleen rarely calls for any special notice; and even in such conditions as spleno-medullary leukaemia, when the massive spleen forms an integral part of the pathological picture, it still remains only a part. But when all such forms of splenomegaly are excluded there remains a residue of cases in which enlargement of the spleen is the prominent clinical and pathological feature.

In recent years the tendency to treat these forms of splenomegaly by splenectomy has become more and more pronounced, but it must be recognized that this treatment is purely empirical. Now, while no one will demand that medical and surgical treatment must always wait upon an exact knowledge of pathology—for this would almost reduce us to therapeutic impotence—and while no one will deny the triumphs of empiricism in clinical practice, yet when surgical interference implies, as it does in these cases, the removal of an organ, it is not too much to ask that we

* Sir Kennedy Dalziel performed splenectomy on this patient on August 3rd. Unfortunately, as the result of giving way of stitches, a mild peritonitis supervened and caused death six weeks later.

should at least consider what we are removing, even if we are undecided upon the justification for this course of action.

The Physiology of the Spleen.

Our first difficulty in attempting to understand the pathology of the various types of splenomegaly is our ignorance of the normal physiology of the spleen. Physiologically the spleen is a mysterious organ, and we know little of the part it plays in normal life; but one thing, at least, is certain: neither functionally nor anatomically is the spleen an entity in the sense that organs such as the liver and the kidney are, but structurally and physiologically it must be regarded as a constituent of a system or systems. Attempts have been made to link the spleen physiologically with the ductless glands and the sympathetic nervous system, and also with the alimentary canal, but the evidence in support of these views is as yet scarcely conclusive. But the place of the spleen in both the haemopoietic system and the reticulo-endothelial system is well established.

As a constituent of the haemopoietic system the spleen is chiefly active in foetal life; after birth it ceases to form red or white cells, except in pathological conditions, when the pulp may undergo a myeloid metaplasia. A moderate degree of this may sometimes be seen in pernicious anaemia and even in acholuric jaundice. I have seen it very pronounced in polycythaemia rubra, and it is, of course, a commonplace of myelogenous leukaemia. But it must be remembered that any abnormal cells present in large numbers in the circulation will tend to accumulate in the meshes of the pulp, and give the appearance of a local origin. However, though it is not normally active as an organ of haemopoiesis, the spleen is active throughout life in removing senile or imperfect red corpuscles from the circulation. This is effected by phagocytosis carried out by the endothelial and reticular cells of the pulp and not by any extracellular process of haemolysis; an important fact which must be borne in mind when considering the possible influence of the spleen in the anaemias.

Probably the most important rôle of the spleen is that which it performs by virtue of the membership of the reticulo-endothelial system which it shares with the bone marrow, the lymph nodes, and the liver. In this capacity it acts as one of the great phagocytic organs of the body, and is intimately concerned in processes of infection and immunity. Organisms reaching the spleen, either in the bodies of mobile phagocytes or in the blood stream, are engulfed by the endothelial and reticular cells, and if not destroyed may remain latent for a considerable period of time; in these circumstances they are obviously dangerous as a possible source of general infection. Such a condition is commonly seen in the splenomegaly of malaria, and a similar process of phagocytosis, with incomplete destruction of the microbes concerned by the corresponding cells of the bone marrow, is an important factor in the incidence of acute osteomyelitis and tuberculosis of bone. There is also a good deal of evidence to show that the production of immune bodies takes place in the spleen and bone marrow, for in guinea-pigs infected with cholera vibrios or typhoid bacilli extracts of the spleen and marrow are found to be far richer in these substances than extracts of other organs. Further, it has been shown that splenectomized rats are more liable to infection than normal animals.

Experimental Work.

An enormous amount of experimental work has been done in the attempt to discover what part the spleen plays in normal life. R. M. Pearce and his co-workers have been pre-eminent in this field, and in their various publications, particularly in their book on *The Spleen and Anaemia*, the literature of the subject is well surveyed. Two main lines of investigation have been pursued—the excision of the spleen, and the administration in various ways of splenic extracts. On the whole, the results have been disappointing, and there is a considerable discrepancy between those obtained by different workers. The administration of splenic extracts has given little or no information, and in any case such a line of research must always be scrutinized with care. Reasoning from the analogy of the action of thyroid and other extracts of the ductless glands, it has almost come to be accepted that the action of an extract of an organ is invariably the same as the action of the whole organ in the body. But this is not always so. The red blood corpuscle is essential to life, but the haemoglobin extracted from it is not only useless but actually poisonous when present free in the circulating plasma.

Excision of the spleen has given rather more definite results. It has long been known, of course, that the spleen is not essential to life; and careful experiments, carried out chiefly on dogs, have shown the immediate and remote results of splenectomy. Briefly these are as follows: An anaemia of the secondary type develops immediately and becomes progressively worse for about a month, when it begins to improve, a normal condition of the blood being found in about two and a half to three months. Sometimes the whole reaction may be delayed, and occasionally the final blood count is higher than before the splenectomy. The change affects the haemoglobin content as well as the number of corpuscles. There is, on the other hand, an immediate increase in the number of leucocytes, due entirely to a polymorphonuclear leucocytosis, and usually amounting to three or four times the normal. This falls rapidly to about double the normal, and then more gradually till in from one to four months the count becomes the same as before the splenectomy, though some observers state that there is a relative lymphocytosis.

A more important result, however, is seen in the increased resistance of the erythrocytes which rapidly follows splenectomy and lasts for a long period—months or even years. This increased resistance may be studied *in vitro* by exposing the corpuscles to haemolytic serum, to haemolytic agents such as saponin, or to hypotonic solutions of sodium chloride. Similarly, it may be demonstrated *in vivo*, for jaundice and haemoglobinuria can only be produced in splenectomized animals by the administration of two or three times the dose of a haemolytic poison which is required to produce a similar result in normal animals. How these results are brought about is quite unknown. The increased resistance of the red cells does not depend upon the presence of immature and possibly more hardy forms in the circulation, for these cannot be demonstrated in any numbers. But it is apparently definitely associated with the anaemia, because it is often present in non-splenectomized animals rendered anaemic by bleeding or other procedures. The lessened tendency to jaundice in anaemic animals may possibly be due to the fact that in these conditions the normal destruction of red cells is diminished, and there is less accumulation of haemoglobin and its derivatives in the liver. It is presumed that the liver has a normal saturation point of haemoglobin; if this is exceeded it is no longer possible for it to deal with the pigment and secrete it in the bile in the normal way, and jaundice ensues. In the anaemic animal the liver is hyposaturated with haemoglobin and can tolerate the amount of pigment brought to it as the result of the action of haemolytic agents, so jaundice does not occur. For the splenectomized animals a somewhat similar explanation has been brought forward. Whereas the spleen under normal conditions is the chief site of blood destruction, and rapidly passes on the haemoglobin derivatives to the liver, in splenectomized animals the blood destruction is carried out in lymphatic glands and in the bone marrow. From these widespread foci the haemoglobin derivatives reach the liver gradually and slowly; the liver is not suddenly overwhelmed by these products, but has time to assimilate and secrete them in the normal way. These explanations, however, are purely theoretical.

Later results of splenectomy are seen in the bone marrow and the lymph nodes. In the bone the fatty marrow is transformed into red marrow. This change, again, is obscure, but it possibly represents the assumption by the marrow of the function normally exercised by the spleen, of the storage of iron for utilization in the formation of fresh red corpuscles. In the lymph nodes there is hyperplasia of the endothelial cells, which become actively phagocytic of red cells and haemoglobin in conditions of artificial blood destruction. The lymph nodes therefore take over the functions usually exercised by the spleen.

These observations have all been made on experimental animals. Splenectomy, except for rupture of the organ, is rare in the healthy man or woman, and the difficulty of obtaining data from the normal human subject is very great. Such cases as are recorded, however, seem to show that the blood counts show the same variations in man after splenectomy as are seen in experimental animals.

The Pathology of the Spleen.

If the physiology of the spleen is obscure, the pathology is even more difficult. The two conditions in which it is claimed that splenectomy is of real value are Banti's disease, or splenic anaemia, and acholuric jaundice. In the primary blood diseases, pernicious anaemia and the leukaemias, there is no

YOUNG: ROUTINE TREATMENT OF FRACTURES BY OPERATIVE METHODS.

FIG. 1.—Fracture of lower jaw. Showing how complete fixation was secured by a single brass wire. No splint was used externally.

FIG. 2.—Fracture of upper end of humerus; adult woman. Note gross displacement of distal fragment into axilla.

FIG. 2A.—Fracture of upper end of humerus; same as in Fig. 2. Fixed by long pin passed from upper fragment down into shaft. (Dr. A. J. Hutton.)

FIG. 3.

FIG. 3A.

FIG. 3.—Fracture of both bones of forearm, with impaction of radial fragments, and radial displacement of distal ulnar fragment, after fixation by open operation. Radial fragments corrected under anaesthetic, but not directly fixed. Ulnar fragments fixed by single fine "sprig."

FIG. 3A.—View of same, lateral aspect.

FIG. 4.—Fracture of lower end of humerus. Young adult male. Fracture T-shaped into elbow-joint.

FIG. 4A.—Same as Fig. 4 after pinning and plating. Antero-posterior view.

FIG. 4B.—Same as Figs. 4 and 4A. View in profile.

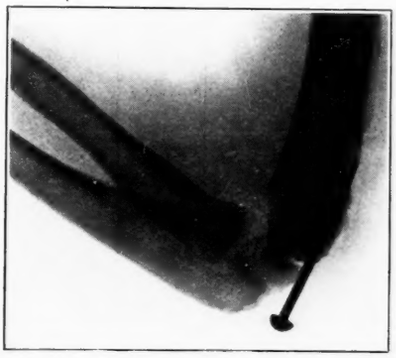

FIG. 5.—Fracture-separation, lower end of humerus; boy, aged 13. After direct fixation by two pins, one of larger type and the other a fine "sprig." This skiagram shows both still in place.

FIG. 6.—This skiagram was taken after removal of the larger pin.

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FIG. 7.—Fracture-separation of epiphysis at lower end of humerus in a boy of 7 years. The capitellar epiphysis was grossly tilted outwards.

FIG. 9.—Same as Figs. 7 and 8, after fixation of replaced epiphysis by single fine "sprig." View in profile.

FIG. 11.—Fracture of clavicle, with separation, and tilting downward, of a central fragment.

FIG. 8.—Same as Figs. 7 and 9. Antero-posterior view.

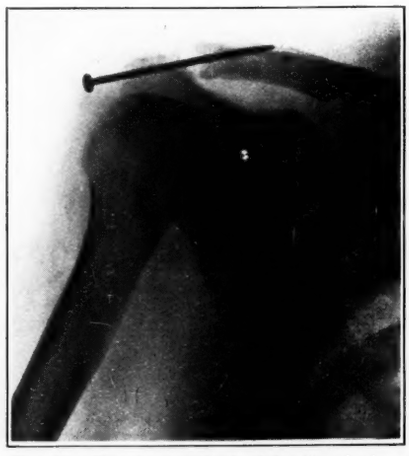

FIG. 10.—Showing method of fixation by long steel pin. Fracture of outer end of clavicle; an adult male (outer fragment was impossible of correction—grossly displaced).

FIG. 11A.—Same as Fig. 11, after treatment by open operation, and direct fixation by small plate and encircling wires.

THE LATE SIR JAMES GALLOWAY: HODGKIN'S DISEASE.

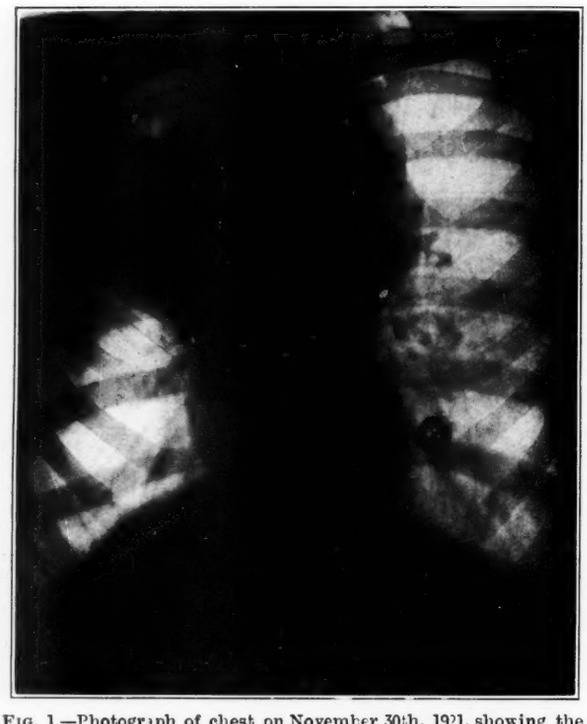

FIG. 1.—Photograph of chest on November 30th, 1921, showing the [illegible] before treatment by x-rays.

FIG. 2.—Photograph of chest, January 11th, 1922, showing diminution of the mass under x-ray treatment carried out since November 30th

theoretical justification for the operation. In malaria the enlarged spleen may be a source of reinfection, and in this, as in other tyes of splenomegaly, the enlarged organ may cause considerable discomfort. Further, it is liable to rupture spontaneously, or from slight trauma. For these reasons splenectomy may be justified, not only in malaria but in other splenomegalies, although the primary cause of the lesion is not influenced by the operation. But in acholuric jaundice and Banti's disease it is claimed that the spleen is the primary focus of the disease, and its removal is justified on these grounds.

In acholuric jaundice, although the spleen shows no specific change in structure, the results of splenectomy appear to be really very good, and the experimental observation that the fragility of the red blood corpuscle is diminished after splenectomy is a strong argument in support of this treatment; for increased fragility of the red cells is the characteristic feature of the disease. But in a considerable number of cases the fragility of the red cells has not altered after splenectomy, though clinically the patients have been cured by the operation. Further, all our information goes to show that the spleen is not an entity, but that its normal functions are taken over, if it is removed, by other tissues. Is it not reasonable to assume that its hypothetically evil influences may likewise be exhibited vicariously?

Splenic anaemia, or Banti's disease, presents an even more difficult problem. The terms are frequently employed synonymously, though of recent years the tendency has been to drop the name "splenic anaemia," since it is recognized that it may include a variety of conditions besides the disease described by Banti. In a small series of cases of clinical splenic anaemia (*Journal of Pathology and Bacteriology*, vol. xxiii, 1920, p. 413) I found examples of Gaucher's and Stengel's splenomegaly, as well as Banti's disease.

Banti's disease possesses the following characteristics: It occurs in young, healthy adults and runs a very chronic course. The first stage may last for twelve years, and in it the patient exhibits a gradually increasing weakness and pallor with digestive disturbances, progressive enlargement of the spleen, and a moderate anaemia. The second stage is short, being measured in months, and presents attacks of dyspepsia and diarrhoea, an excess of urobilin in the urine and slight increase in the size of the liver. The third stage is practically that of an increasing cirrhosis of the liver. On examination, the spleen in Banti's disease shows little beyond a general fibrosis. In some cases I have found increased phagocytosis of red cells, with proliferation of endothelial cells and the presence of megakaryocytes, but the changes are far from specific. Further, the clinical entity of a chronic disease lasting for so long and with such indefinite symptoms is open to question. It may well be that Banti's disease covers a variety of conditions; in any case I cannot regard it as proved that the spleen is the primary focus. It may reasonably be hoped that careful study of a larger number of cases, combined with further experimental observations, may clear up the obscurity which at present surrounds the condition of splenomegaly. But in our present state of ignorance surgical treatment must be regarded as in the experimental stage.

III.—SIR KENNEDY DALZIEL, M.B., C.M., F.R.F.P.S.,
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[*Abstract.*]

SIR KENNEDY DALZIEL congratulated the previous speakers on the important aid they had given to splenectomy. The subject was one of enormous importance and required all the elucidation that the physiologists, pathologists, and clinical workers could give in determining the functions of the organ and so clarifying the field for surgical interference.

Already it was obvious that haemolytic jaundice and splenic anaemia were materially benefited by removal of the spleen. Tumours, tuberculous disease, and possibly malarial spleen required removal. Splenomegaly by its discomfort ought to be treated by removal of the spleen.

The operation presented no great surgical difficulty, and was not attended by a greater mortality than was to be expected in operations on asthenic patients. The post-operative diminution of the red cells had not been found to decrease, nor increase of the white cells more than was to be expected after a major operation. Little shock had been noted and the mortality up to date had been *nil*. No doubt haemorrhage was to be feared, and the distended veins in the gastro-splenic omentum might well cause alarm. A free incision along the inner border of the rectus would generally be found sufficient; in a large spleen a second lateral incision along the course of the tenth nerve enabled the organ to be fully exposed, and after dividing the costo-colic membrane which supports the spleen the vessels could be controlled by a long clamp applied close to the tail of the pancreas. A second clamp close up to the spleen enabled the organ to be removed without soiling the peritoneum. Thereafter the vessels in the stump were ligated separately. Adhesions were apt to be troublesome in cases of splenic anaemia, but if the splenic arteries had been ligated these could be separated with the loss of very little blood if tampons were used as the separation progressed. The spleen was not essential to life. Disorder of it might threaten life, and it could be removed with a great measure of safety.

A FIVE YEARS' SURVEY OF THE ROUTINE TREATMENT OF FRACTURES BY OPERATIVE METHODS;

WITH SPECIAL REFERENCE TO CERTAIN PRACTICAL DETAILS AND MODIFICATIONS IN THE USUAL PROCEDURES OF DIRECT FIXATION.

BY

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[*With Special Plate.*]

THE title of this paper is perhaps somewhat misleading in that it is hardly my intention to deal exhaustively or comprehensively with all the material that the five years have brought under our observation, nor, indeed, do I propose to take up, in detail, or in more than a casual way, the more or less technical points which a full consideration of the large series of cases might suggest. Nor, indeed, would the time allowed to me permit of it.

I propose to deal shortly with some of the conclusions that seem to be suggested by the figures I am able to submit, and thereafter to draw attention to certain special points in technique, and to the particular applicability of certain fixation procedures to certain types of fractures or fracture-separations, which our experience, more particularly in the five-year period in review, has led me to deal with more freely than I had formerly done, and perhaps in a manner somewhat novel. I shall express my views and give my reasons for the faith that is in me at the appropriate stage.

First of all, may I refer briefly to a contribution I had the opportunity of submitting to the Surgical Section, at the discussion on the operative treatment of simple fractures, when the Association met in London in 1910? The reference that I wish to make here is to the tendency to limit the term "operative" in such a way as to include only such methods as require open incision. As I said then, I am of opinion that such a limitation is unwarranted. The term "operative treatment" should not necessarily imply open operation. Any form of manipulation, especially if under a general anaesthetic, is an operative procedure. So much being said, I may proceed to admit that the chief purpose of this paper is concerned with the more limited field of open operation, and specially with the methods by which direct fixation of bone fragments can best be achieved.

It will be well, perhaps, if I plunge at once *in medias res*, and lay before the Section the facts and figures which emerge from our survey of the five years referred to in the title of the paper.

The period taken is from May 1st, 1917, to May 1st, 1922. The cases included were all confined to my own surgical unit in the Western Infirmary, Glasgow, during that period. No cases have been included from my private practice, nor from any other clinic, nor have there been included any cases from other surgeons. A small number, though dealt with in my wards, were not treated by myself; but these were in the hands of my junior colleagues—my assistants—whose procedure and methods are, I know, not antagonistic to mine. It is not that my interest in open operative procedures, and in the modern methods of fixation by open operation, in

fractures of the most varied kinds, is a thing of recent birth; nor is it that I cannot look back upon, and even produce figures from records of, now a good many years. Far from that, I expressed my faith and indicated the general principles that guided me in the open operative treatment of fractures at the discussion on the subject in 1910. I had been operating on many fractures before that time. I have continued to do so since, and on an increasing scale.

My reason for taking this period of five years is that it represents a well-defined period of time, within recent view, for which I have full records, in a single surgical unit over which I have had, throughout the period mentioned, practically complete control. For the figures, the reports of my colleagues who have assisted me throughout, and my own reports, are able to vouch fully. I shall take the opportunity of contrasting the figures of this period with the figures, on certain points, from the records of the Broadstone Jubilee Hospital, Port Glasgow, for the nine years (1908–16) during which I had charge there.

The total number of cases of fractures of all kinds—skull, trunk, and limbs—in my wards in the Western Infirmary, during the five years, May 1st, 1917, to May 1st, 1922, amounted to 693. In the treatment of these, a general anaesthetic was administered in 459—usually chloroform—in some cases several times. The total number of administrations in the treatment of the whole series of fractures was 638. Out of the 693 cases, open operation was carried out in 272. In the remaining 421 there was no open operation. Of the 272 cases submitted to open operation the immobilization of the fragments was secured by some method of direct fixation in 103.

It emerges, therefore, that (1) open operation was carried out in 39.25 per cent. of the series; (2) direct fixation was carried out in 14.86 per cent. of the series; (3) direct fixation was carried out in 37.86 per cent. of the cases of open operation.

In the table which follows (Table I) I have presented the corresponding figures for each year. In the first column are shown the total numbers of fractures treated indoors in each year. In the second column are the numbers of cases submitted to open operation each year. Column three gives the numbers of cases in which direct fixation of fragments was carried out. The fourth column shows the percentage, in each year, of the whole series, of those submitted to methods of direct fixation. The fifth column gives the percentage, in each year, of cases submitted to open operation, in which methods of direct fixation were resorted to.

TABLE I.—*Number of Cases of Fracture of all Kinds, Treated in the Wards of Mr. Archibald Young, in Each of the Five Years, May, 1917, to May, 1922, along with the Number of Cases submitted to Open Operation and the Number Treated by Direct Fixation; with Relative Percentages for Each Year.*

Year.	Total Fractures.	Open Operation.	Direct Fixation.	Percentage of Total.	Percentage of Open Operation.
1917–18 ..	127	42	9	7.85	21.4
1918–19 ...	135	49	11	8.14	22.4
1919–20 ...	161	62	28	17.39	45.16
1920–21 ...	152	58	19	12.50	32.76
1921–22 ...	118	61	36	30.50	59.0

For comparison is shown the following table from the records of the Broadstone Hospital, Port Glasgow, while under Mr. Young's care, 1907 to 1916.

TABLE II.

	1908	1909	1910	1911	1912	1913	1914	1915	1916	Total for 9 yrs.
Total fractures ...	40	54	74	84	90	101	68	82	74	667
Treated by direct fixation	1	2	6	5	8	1	8	6	3	40
Percentages	2.5	3.7	8.1	5.9	8.8	1.0	11.7	7.3	4.05	6%

It will be seen from Table I that (1) the percentage of all fractures in which direct fixation was employed has mounted up from 7.86 in the first year (1917–18) to 30.50 in the fifth year (1921–22); (2) the percentage of all cases of open operation in which direct fixation methods were employed rose, in the same period, from 21.4 to 59. This is, I believe, a very striking fact. It becomes more striking still when taken in contrast with the figures which I give, from the Broadstone Jubilee Hospital, Port Glasgow, showing, for each of the nine years 1908 to 1916 inclusive, the number of cases of fracture, with the number submitted to direct fixation by open operation, and the relative percentages. (See Table II.) Contrast the highest percentage in this series (that for 1914—namely, 11.7) with the lowest in the present series —namely, 21.4; and again with the percentage of last year—namely, 59.

I feel that I am entitled to advance here, on these figures, the claim that direct fixation of fragments by open operation in an increasing proportion of fractures has been well established. The mere fact that year by year we resort to an ever-increasing number of direct fixations by open operation of itself proves our faith in its efficacy and our belief in its value compared with the older methods. It is not that other modes of comparison are wanting, nor that such other comparisons have not been made. Indeed, following more particularly upon the discussion in 1910, the special methods advocated with so much enthusiasm by Sir Arbuthnot Lane, and their results, were investigated by a committee of the Association, and the report drawn up by that committee will be within the memory of members of the Section. I do not know that the report in question gave much satisfaction to anyone, nor do I think that anyone was really convinced that it proved the case for either side—either the non-operative or the operative. After all, it is well recognized that figures may be made to prove almost anything, provided that one looks at them from the proper angle. Results, too, are apt to be construed differently by different observers, some desirous to be severely impartial—but perhaps not too sanguine or very sympathetic—others disinclined to admit that their own technique or their operative dexterity is in any respect faulty or in any way defective.

The figures of these five years, on the other hand, show that we, for our part—for our part, I say, in that I am desirous to include, in this expression of faith, my various colleague assistants, who have helped me all throughout—that we have not only not lost faith in the methods, but have, indeed, been increasingly confirmed in our confidence in their advantage over the methods previously employed. After all, it is not merely a case of "another scalp to my belt." Anyone who has witnessed many open operations for direct fixation of fractures, anyone who has ever taken part, either as assistant or as principal, in many such operations, will admit readily, I am sure, that it is too often the case that the physical energy and the endurance of all concerned are taxed to the uttermost in their execution; that, in fact, all concerned directly in the operation have very commonly to "sweat over it"—in a very real and literal sense. Speaking for myself, I am bound to say that my own physical strength has too often been stretched to the uttermost in such operations to encourage me to continue to resort to them, were it not that I am more and more convinced of their efficacy, and, indeed, of their unchallengeable superiority, in a very large proportion of cases. Under such circumstances, our continuance—nay, our increasing employment—of direct fixation by open operation would seem to me to be a very powerful argument in its favour.

I shall proceed now to give details of the different fractures dealt with in the series in which direct fixation was carried out. In Table III there is presented a list of all the bones affected, with a note, in succeeding columns, of the actual procedure adopted. The methods included wiring, fixation by different kinds of pins or nails, screws, plates and screws, and by combinations of pin and plate; also, in only one case, by ring plates (Adams).

Wiring was resorted to in 21 cases, pinning or nailing was employed in 29, plating was used in 48, fixation by screws in 2, pin and plate were used together in 2, and ring plates were used in 1. The bones dealt with included lower jaw, clavicle, humerus, olecranon, radius and ulna, metacarpal, phalanges of fingers, femur, patella, tibia, and metatarsus. It will be seen from the table that a considerable number of epiphyseal fracture-separations were treated by this method, including upper and lower epiphyses of the humerus and upper epiphysis of the femur. A few words have to be said of the different types of procedure, as well as of certain special groups of fractures and fracture-separations.

TABLE III.—*Showing the Numbers of the Fractured Bones Submitted to the Different Methods of Fixation in the Five Years' Series.*

	Wiring.	Pinning.	Plating.	Screwing.	Pin and Plate.	Ring Plate.	Total.
Lower jaw	7*	...	...	...	...	...	7
Clavicle	1	...	3	...	...	...	4
,, outer end	...	1	...	...	...	...	1
Humerus, upper end ...	...	4†	1	...	...	...	5
,, shaft	...	...	6	...	...	...	6
,, lower end (T) ...	...	...	...	...	2	...	2
,, lower epiphysis	...	16	...	...	...	...	16
Olecranon	5	...	...	...	...	...	5
Ulna	...	3	...	...	...	...	3
Radius	...	...	2	...	...	...	2
Radius and ulna	...	...	2	...	...	...	2
Metacarpal	...	1	...	...		...	1
Phalanx, finger	1	1	...	...	...	...	2
Femur, upper end	...	2‡		...	...	...	2
Femur, shaft	...	...	12	2	...	1	15
Patella	4	...	...	...	...	...	4
Tibia	3		22	...	...	...	25
Metatarsus	...	1		...	...	...	1
Totals	21	29	43	2	2	1	103

* In 4, the jaw was wired direct; in 2, the teeth were wired; in 1, the jaw was wired, and the teeth also.
† One of these was an upper epiphyseal separation.
‡ One of these was a separation of the upper femoral epiphysis.

METHODS AND MATERIAL.

1. *Wiring.*

The use of wire in the fixation of fractures has fallen to some extent out of fashion. The chief reason for this is, I think, not far to seek. The material used was, for long, silver wire, and this has not the necessary strength to allow of fragments being fixed at all firmly by its use, unless very thick wire is used. Over and over again it must have happened to most surgeons employing silver wire that, just at the point of securing something like the desired degree of fixation by its use, the wire has snapped short at the twist point, and no end of trouble has followed in the effort to retrieve the calamity. Often, indeed, its use was completely unsatisfactory by reason of this recurring difficulty. Thick wire, too, is always a disadvantage. The finer the wire it is necessary to introduce into the tissues to bury in the bone or to leave embedded in the soft tissues the better. But, after all, the prime necessity is that the wire so introduced shall efficiently serve the purpose for which it is employed. A wire that is not capable of standing the strain that may be required if it is to be made really taut—for, short of that, it is not of real value as a fixation material—is so unreliable as to be hardly worthy of use.

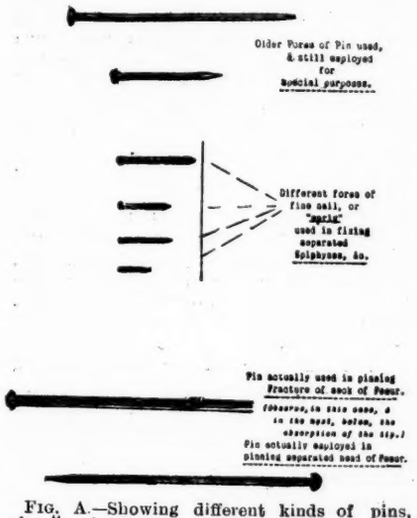
Older Forms of Pin used, & still employed for Special purposes.
Different forms of fine nail, or "sprig" used in fixing separated Epiphyses, &c.
Pin actually used in pinning Fracture of neck of Femur.
(Observe, in this case, a in the next, below, the absorption of the tip.)
Pin actually employed in pinning separated head of Femur.

FIG. A.—Showing different kinds of pins, also "sprigs," used. At the lower part of the figure are seen two long steel pins, actually used in fixing fractures of femoral neck, showing absorption of tip.

For some time now I have been in the habit of making use of a brass wire of very much less thickness than I should ever have dreamed of using, or of attempting to use, had it been of silver. I used it first of all with some little doubt as to its effects on the tissues, and as to the effects of the tissues on it. Experience, however, has shown that it has no obvious harmful effects on the bone or on the soft tissues; nor have the tissues any harmful effect on it. One cannot say, of course, that the tissues will not produce in time some effect on it. Indeed, from what one has observed even in the case of steel pins long embedded in bone one must have it in mind that, sooner or later, the tissues will exert some resolvent effect. We have observed on several occasions how the sharp point of a long steel pin has been eroded by the tissues, even in a short period of four to six weeks (see Fig. A). But, in any case, it will be found, I believe, that even the thinnest grade of brass wire that we have employed will resist the action of the tissues for a much longer time than the period required of it.

I am able to show to the Section samples of this brass wire in different grades—most of them, as will be seen, of comparative thinness—which I have been able to obtain from the original source where I got my first supply. Each grade is marked with its appropriate number according to the wire workers' gauge. The samples of wire shown have the following numbers, and I am able to give, with the numbers, the thickness according to gauge, thus:

Brass wire—
No. 21 ... ... .032 gauge.
22 ... ... .028 ,,
23 ... ... .024 ,,
24 ... ... .022 ,,
25 ... ... .020 ,,
26 ... ... .0184 ,,
27 ... ... .0164 ,,
28 ... ... .0148 ,,
29 ... ... .0136 ,,
30 ... ... .0124 ,,
Sample of nickel wire—
No. 28 ... ... .0148 gauge.
Sample of monel wire—
No. 30 ... ... .0124 gauge.

From the same source I have obtained recently samples of two other kinds of wire, which may prove to have certain advantages. The one is of pure nickel, the other is of a comparatively new metal, named monel metal. It is, I believe, an alloy of copper and nickel (copper 67 per cent., nickel 33 per cent.), is very pliable, and my friend claims for it that it is of greater tensile strength than either brass or nickel wire of the same thickness. I have not tried it yet.

The point of importance, however, is that one is not restricted to the use of silver wire; indeed, silver wire is, in my opinion, quite unsuitable, for the reason stated above. Possessing, however, in brass wire, or in one or other of the wires mentioned later, a really efficient and reliable substitute for the older silver wire, I find, once more, a considerable field for the operation of wiring. It may be said, here, that it is my practice to pass the wire through the flame of a spirit lamp immediately before introducing it. It has been sterilized in the usual way beforehand, of course. This final heating has the effect not only of "making siccar" the sterilization, but it makes the wire much more pliable, even if it does take away—perhaps because it does—its temper.

By using brass wire we can obtain a very high degree of stabilization. Repeatedly I have been able to tighten a wired junction so completely as to fix it by even a single wire. In one case of fracture of the lower jaw, for example—the case is shown in Fig. 1—it will be seen that there is only one small wire used. Yet the fixation was absolute, and the result was never in doubt. It was as nearly as possible perfect.

In the series under consideration wiring was employed twenty-one times as a sole fixation agent—for fractures of the jaw, olecranon, patella, clavicle, tibia, and in one case of fracture of a phalanx. The results were in all cases good. It may be said, in passing, that in fractures of the lower jaw we may combine—and often do—direct wiring of the bone with indirect fixation of fragments by wiring of the teeth. Brass wire serves admirably for this purpose also, and it will be obvious to anyone who has ever made the attempt to wire the teeth in such circumstances what a great advantage it is to be able to employ a wire of such fineness, and which can be slipped so easily between the often very closely set teeth. A thicker wire would be quite useless for the purpose. The thin wire, too, can be wound several times round the teeth it is intended to secure.

2. *Pinning or Nailing.*

It will have been observed that the group of cases treated by this method is a relatively large one—29 cases in all. Using, at first, different sizes of the old steel plated pins, such as have been in use for many years for such purposes as fixation after resection of the knee, we have, for certain special purposes, resorted to much finer agents. Here we are following, to some extent, the same idea as justifies our use of a finer wire. Obviously, the less bulky the pin or nail, so long as it is of sufficient strength to fulfil its paramount purpose, the better it must be; the less likely will it be for bone fragments to be split in its introduction; the less drilling will be necessary; the less bone dust will be scattered about the tissues; the less disturbance of the parts generally will be required (see Fig. A).

For certain purposes, of course, such as fixation of the upper femoral epiphysis, or of fractures of the femoral neck, by a nail driven along the femoral neck into the head, a very long nail is required. A nail of such a length must be thick and strong. So also in fixation of fractures of the upper end of the humerus, where a long nail is employed—whether it be passed from the epiphysis down into the diaphysis, or in the reverse direction. A thin, light nail will not serve in any of these cases (see Figs. 2 and 2A).

In another class of fracture, or fracture-separation—namely, fracture-separations of the lower epiphysis, or epiphyses, of the humerus—a much smaller, much finer nail or pin is much more suitable. We used to employ at first nails of the ordinary type as referred to above, but of course of much shorter size. I very soon came to the conclusion that a much finer agent must be obtained. Accordingly I began to use very fine pins, or "sprigs"—you may perhaps know them by different names. I think the carpenter calls them "sprigs" or "fine wire nails." The first I used I took from a small store kept in my house for the purpose of fixing photographs to the wall. Those were slightly flattened in section, head as well as nail length. Those we have been using for a long time now are of the rounded type, and we procure them as we require them from the infirmary carpenter. Their cost is practically *nil*. We do not worry about plating them. Even if we do not in time remove them, though they may erode in due course, they do no harm in the tissues or in the bone.

I have used them now in a considerable number of cases, both alone and also in combination with other agents. It is not only in the case of fracture-separations that they find their field of usefulness. I have used them in fractures of forearm bones (Figs. 3 and 3A) and elsewhere. In the more recent months I have been employing them in certain badly displaced fractures of the phalanges of the fingers, and in similarly badly displaced fractures of metacarpals. The pin is passed from one fragment—usually the smaller—into and along the other, being left as a permanent central axis in the corrected phalanx. It does no harm in its new bed.

One advantage in the use of these fine pins or nails is that they are so easily driven home, and that they do not split the often very fragile fragments. Likewise, they do the very minimum of damage to epiphyseal cartilage or growth centres. In a young person it is often possible to drive the fine pin well home without any preliminary drilling, without any great force being called for. Occasionally a few light taps with the heavy end of a periosteal elevator may be required, but that is all.

3. *Plating.*

So much has been written regarding plating that it is not necessary to say much more here. Besides, we have had to-day, from another surgeon, already a paper on the subject. Suffice it to say that we have employed, during the five-year period, the method of fixation by plate and screws in 48 cases, and certainly with satisfaction. We have applied it to the clavicle (Figs. 11 and 11A), forearm bones, humerus, femur, and tibia. Properly employed, it gives satisfactory fixation, and does not retard union. Whether the plate and screws require to be removed later on does not greatly matter, so long as they serve their immediate purpose. I am of opinion, however, that more and more the field for application of plating will tend to become narrowed down to shaft of humerus, shaft of femur, and to tibia. In other situations, it seems likely that wiring or pinning will become the operation of choice.

As in wiring and in pinning, we always pass the plates and screws through the spirit lamp flame prior to introducing them.

4. *Screwing.*

In certain fractures of the shaft of the femur, or of others of the longer bones, it will occasionally happen that the introduction of a plate may be undesirable or difficult. In two cases of the kind in this series we fixed the fragments quite satisfactorily by screws alone. One, by my colleague Dr. A. J. Hutton, was fixed by one screw. The other, by myself, was fixed by two screws. Both did well. It is probable, however, that this method will have only a limited application.

5. *Pinning and Plating.*

In the series are included two cases of very severe fracture of the lower end of the humerus, T-shaped, into the elbow-joint. Every surgeon knows how difficult these fractures are to deal with by any other method than open operation. Any surgeon who has tried will know also how difficult they are to deal with, even by open operation. The chief difficulty lies not in the freedom of access to the fragments, but in the great difficulty there is in keeping the lower fragments in apposition while they are fixed to each other, and while they are being fixed to the shaft fragment. We have found, as Figs. 4, 4A, and 4B show, how great is the tendency for the two lower fragments to rotate on their long axes, by the action, no doubt, of the group of flexor-pronator and extensor muscles respectively, arising, as they do, from the epicondyles and epicondylar ridges. We have adopted the expedient of first fixing the two lower fragments by the introduction of a long steel pin, passed from side to side, right through both, and thereafter applying the Y-shaped plate and screws. The *x*-ray illustrations, which I am able to show, will abundantly illustrate the difficulty referred to and the result of the method as described.

I may say that in both of the two cases referred to the result as regards union, outline, and function has been most gratifying.

6. *Ring Plates.*

The use of Adams's ring plates may be dismissed in a very few words. We have used them only once, and they did not give satisfaction. The plates were not difficult to apply, but they shifted somewhat, and allowed of the fragments—of the femur—assuming an acute angular bend, which did not leave a good effect, aesthetically; nor was function easily restored. I do not think that we are at all likely to employ them again.

One more word, with reference to methods and material, may be permitted here. It may be assumed that the simpler the methods, and the simpler the materials, the greater will be the field of application of the direct fixation procedure in the open operative treatment of fractures. Complicated apparatus, complicated instruments, heavy nails, screws, and plates will always be undesirable if simpler appliances and materials are available. I ventured to say, in my contribution to the discussion in 1910, that I had no use for certain of the complicated instruments advocated by some surgeons. I am of the same opinion still.

The most important requirement of all is a competent assistant (preferably a plurality of competent assistants), and such I have had the great good fortune to possess all along. I am also indebted more than I can say to the willing help of my nursing staff. And I desire here to make acknowledgement of this.

In what remains of this paper I wish to refer to the open operative treatment of three types of injury in which we have been doing, for some time now, a considerable amount of direct fixation. These are:

1. Epiphyseal fracture-separations.
2. Certain fractures of the phalanges and metacarpals.
3. Fractures of the outer end of the clavicle and, incidentally, that troublesome injury, so difficult to treat satisfactorily in any other way—namely, dislocation or fracture-dislocation of the outer end of the clavicle, with displacement upwards of the outer, or acromial, end of the clavicle.

FRACTURE-SEPARATIONS OF EPIPHYSES.

Many of these, of course, call for no open operative interference. There is often no displacement at all, and the fragments are often capable of easy maintenance in their proper relation with the diaphysis; perhaps by a simple splint, often without splint altogether: nothing more than a firm bandage

may be necessary. This applies to most fracture-separations at the lower end of the forearm bones, and to others such as the lower epiphyses of the tibia and fibula. Even in these, however, the correctness of apposition should be made certain by manipulation under a general anaesthetic, and where possible checked by *x* rays subsequently.

This is, unfortunately, not always, or indeed usually, the case with the fracture-separations at the lower end of the humerus. If in such injuries displacement should happen to be slight, or *nil*, we consider the fact a fortunate one, both for the patient and for the surgeon. It means, as a rule, little trouble and a favourable result, as regards appearance, function, and later growth. Where, however, displacement is, as so often happens, more or less marked—often extremely marked—open operation with direct fixation is in my opinion imperative. I used to think that many such injuries, even with considerable displacement, could be effectively treated by non-operative means, but that idea I have given up completely. I here admit unhesitatingly a change of view on the matter.

I remember that Sir Arbuthnot Lane, in 1910, said in this connexion, "an epiphysis if separated rarely requires to be retained in position by a plate and screws; but should it be necessary to employ such means the plate should be removed as soon as union has taken place, to avoid any interference with the growth of bone at the epiphyseal line." I wonder if he is still of the same opinion as to the necessity for direct fixation in these cases. I, at any rate, cannot subscribe to this view. In any case plate and screws are not at all suitable for the treatment of such injuries, where one has to deal with the small fragile bones of young people, and with small, delicate epiphyseal fragments, which ought to be damaged as little as possible. The employment of fine pins, or "sprigs" such as I have referred to already, is a much more easy, more effective proceeding, and I think their use gives the very minimum of injury to the delicate growth areas.

If it be said, as said it is by some, that even without operative means—open operation—it is possible to get union, in many cases, with quite good function as a result, I still urge that open operation affords the best prospect of avoiding such interference with growth later—in virtue of disturbed epiphyseal centres—as every surgeon knows to be a very real and serious possibility.

It is certainly the case that there are many such injuries where, even with open operation, it is not always easy to accomplish accurate readjustment of a separated epiphyseal segment. How much more, then, must be the difficulty if no open operation is done!

Now, it is just this accurate readjustment of separated epiphyseal centres that, in my opinion, makes all the difference between practically normal continuance of growth of the bone, and the failure, or defect, or irregularity of growth which is so likely to follow if non-operative treatment is adopted, and displaced epiphyseal centres are not brought back into their proper relations. If they are brought back to their proper positions, with reference to the diaphysis and to each other, my opinion is that normal, or almost normal, growth is likely to occur. We shall not have to regret, then, the ugly "gun stock" deformity, and other deformities that we have all had occasion to warn parents of for the future of their child.

I had a very instructive lesson in this respect a year or so since, when in the course of a resection of the knee for tuberculous disease I had the misfortune to completely disengage the whole lower epiphysis of the femur from the diaphysis. I fixed it in position again, but feared the worst in the way of suspended growth. To my surprise such suspension of growth did not result, as shown by continued increase in length of the limb, and as demonstrated beyond doubt by *x* rays many months afterwards.

I believe that if accurate reapposition of epiphyseal centres be not brought about the failure to do so is the very factor that will lead to the growing parts being smothered up in callus and crushed in new, irregular bone, which will effectually lead to suspension of the normal growth at the epiphyseal lines.

That nothing short of full exposure of the fracture-separation area will suffice, if accurate readjustment is to be accomplished, my now considerable experience of these cases has proved to completeness. I have found the whole lower epiphysis of the humerus so completely displaced as to be tilted in almost unbelievable fashion; I have, on quite a number of occasions, found it almost completely inverted, articular surface looking upwards, and epiphyseal cartilage downwards. I have found a fragment, including the capitellum, part of trochlea, and the external epicondyle, so completely tilted on its axis that the articular surface of capitellum looked directly outwards, while the fractured surface rested against the head of the radius. We have had several instances of this. Then separation of the centre for the internal epicondyle, especially if the muscular attachments to it and above it are torn away, means so considerable longitudinal displacement that nothing short of open operation and direct pinning of the fragment in its proper relation can possibly suffice.

In short, the argument in favour of operative treatment of these lower humeral epiphyseal fracture-separations—open operation, accurate readjustment, and direct fixation—seems to me sound beyond dispute.

As to the method of procedure little is necessary to be said. In almost any type of epiphyseal displacement at the elbow, whether of the whole lower epiphysis or of one or more of the separate centres there, I have found the best incision one made just behind the radio-humeral joint, and extending a little way upwards. The joint named is first opened, and usually from this opening it is possible to accomplish all that is desired. The fragment or fragments, once adjusted, are readily fixed by one or two—generally one is sufficient—of the fine sprigs I have described and shown here. The pin is pushed easily home, and the wound is completely closed without drainage. I generally put the limb up flexed. It is usually placed for a few days on a simple splint, and may be put in a light plaster-of-Paris sheath for at most two or three weeks. From that time the child is given almost complete freedom in movement. (Figs. 5, 6, 7, 8, 9.)

CERTAIN FRACTURES OF PHALANGES AND METACARPALS.

It may be conceded quite readily that most simple fractures of the phalanges of the fingers admit of satisfactory treatment without open operative means, and probably even most compound fractures are capable of adequate adjustment without direct fixation of fragments, but we have had recently several examples of such fractures—rather neglected at the time of their reception—in which there had resulted such tilting of fragments that correction of displacement without some method of direct fixation by open operative means was quite impossible. It has happened, too, in several cases, that a single *x*-ray view failed to display adequately, or at all, the considerable palmar displacement which was in the main responsible for the annulment or limitation of function. It is obvious that serious disability must result in such cases from the sharply tilted fragments interfering with the flexor tendons. In several cases, examination of a simple antero-posterior *x*-ray picture gave the impression that the fragments were not much, if at all, out of place, and yet the other view completely altered the picture, and showed how necessary it was to carry out open operative treatment. Such interference of an open operative nature is desirable, also, in not a few fractures of metacarpals where the break has taken place so close to the end of the bone that no non-operative method could possibly ensure proper control of the very short fragment.

Our method in such cases is the same as in the fractures of the phalanges to which I have just referred. The fracture area is exposed usually by a lateral incision, slightly to the dorsal aspect of the finger. The extensor tendon is avoided, or drawn out of the way, and the fragments are disengaged by the simplest means. The ends are then freshened, and brought into as good alignment as possible. A single fine sprig is then driven home, usually from the smaller fragment, along the central canal or soft central bone of the larger fragment, the length of sprig being so chosen as to measure about two-thirds of the length of the reunited phalanx, and the head of the sprig is either nipped off with bone forceps, or buried in the substance of the smaller fragment. It is remarkable how easy is the whole proceeding, and how effective the adjustment. The wound is closed without drainage. A simple splint may or may not be used, according as the operator has confidence in the fixation or not. In any case, it should be dispensed with as soon as possible.

We have been pleased with the results in the cases we have tried the method upon. Bony union has been good, alignment has been well maintained, deformity has been almost *nil*, and the functional result has been gratifying.

FRACTURE OF OUTER END OF CLAVICLE AND DISLOCATIONS OR FRACTURE-DISLOCATIONS AT OUTER (ACROMIO-CLAVICULAR) END OF CLAVICLE.

The treatment of fractures of the outer end of the clavicle has been recognized for long as difficult and unsatisfactory. Further, the outer fragment is often so small that application of a plate and screws is often quite impracticable.

Recently we had a very striking example of the condition in which the small outer fragment was displaced forward and so tilted as to rest on the front of the inner fragment in a direction almost directly forward. It was quite impossible to control it in any other way than by operative means. The method adopted for its treatment was simple, but completely effective. The fracture area was exposed, the small fragment was fixed temporarily, and a long resection pin was passed from a puncture wound made externally right through the fragment and on into the shaft of the bone. This effectively immobilized the fragments. The main wound was closed and the arm was fixed up across the chest in a light plaster-of-Paris sheath, which was worn for three weeks. Thereafter it and the long steel pin were withdrawn. Union, position, and function were in every way satisfactory. (See Fig. 10.)

I interpolate here, though it is not quite in the ordinary purview of this paper's purpose, reference to the use of a similar expedient which I have employed several times in the treatment of the troublesome upward displacement of the clavicle at its outer (acromial) end, in the not uncommon dislocation at the acromio-clavicular joint. I know of no other way of controlling the upward rising acromial end of the clavicle than by fixing it by plate and screws, or by pinning. Wiring is of no real use. The introduction of a simple long steel pin in this way I have found easy, effective, and satisfactory. Further, the result as regards function, movement in every direction at the shoulder, and strength of limb, has left, in the cases in which we have employed the method, little to be desired.

CONCLUSION.

It but remains for me to mention—it should not be necessary to do more than mention—that, in all such procedures as are involved in the open operative fixation of fractures, such as are dealt with in this paper, asepsis is assumed. I mention this but to pass from it. In none of the cases in this series did any trouble arise from the introduction of sepsis. All pursued an aseptic course.

THE TEMPORARY PLATING OF FRACTURES OF THE LONG BONES.

BY

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THE deliberate operative treatment of recent simple fracture may be said to have commenced in 1877 when Lister wired a fractured patella.[1] The way to this had been prepared by similar operations on ununited fracture of the olecranon (Lister, 1873) and of the patella (Hector Cameron, 1877). In the same paper, originally published in 1883, in which the above facts are set down, Lister strongly commends the practice of wiring in ununited fractures of the shafts of the long bones, and he gives details of its employment in a case of malunited fracture of the femur about the junction between the middle and upper thirds. It must not be forgotten that these operations were rendered possible by the antiseptic method of treatment, and in the paper in question Lister emphasizes what he believed to be "the truth, that by antiseptic means we can do, and are bound to do, operations of the greatest importance for our patients' advantage, which, without strict antiseptic means, the best surgeon would not be justified in recommending. . . . That which justified me in operating . . . was simply the knowledge that strict antiseptic treatment would convert serious risk into complete safety" (loc. cit., p. 469).

In the case of the olecranon and of the patella accurate apposition of the fragments is required if crippling is to be avoided; and the need of such apposition is much more clamant in them than in the case of the long bones. That circumstance may explain why surgeons were slow in systematically applying operative treatment to the latter. The impetus was not given, in this country at any rate, till the appearance, in 1905, of Arbuthnot Lane's monograph[2]; but since then there has been an increasing number of surgeons addressing themselves to treatment by open operation. Lane's teaching focused the attention of many on the results of non-operative methods, and stimulated efforts towards the improvement of the same. But Hey Groves[3] is correct in saying that it has also served as a stimulus to workers to improve operative methods. To-day it may truly be said that the operative treatment of fractures has come to be recognized as a method of wide applicability. It seems to me that it is to be recommended in all cases where the anatomical form of the bone has been altered sufficiently to impair the function of the part, and where restitution of that form cannot be obtained by non-operative methods. This recommendation is subject, however, to the proviso that the operation be performed only in suitable surroundings.

It is admitted that incomplete anatomical restitution may be compatible with a good functional result. This is especially the case in fractures of the upper limb; but it obtains also in other fractures in children in whom the education of the parts is proceeding; and in slightly older patients in whom re-education of the limb is comparatively easy. In adults, and still more in middle-aged and elderly subjects such re-education of the muscles and readjustment of the joint surfaces is more difficult. It may easily be incomplete, and a weakened or painful limb may result, a matter of special importance when the fracture involves the lower limb. In any case re-education takes time and delays the recovery of the part. It is to obviate or minimize the need for such re-education, and consequently to expedite restoration of function, that open operation is employed. By operative treatment the surgeon is enabled not only to place the fragments in good alignment, but also to coapt the broken surfaces without muscle or fibrous tissue intervening, and at the same time to employ, if required, some form of retaining apparatus. In this way an almost complete restitution of the form of the bone may be obtained, and the way presumably opened to a speedy firm bony union. I say "presumably" of set purpose; because, as I shall have later to mention, such union does not always follow.

Of the various forms of retaining apparatus at present in use I wish at present to confine myself to the consideration of steel plates and screws, and to record conclusions based upon observations extending over the last dozen years or so.

Bones.

The fractures which most commonly require plating are those of the tibia, the femur, and, less frequently, the humerus. Still less frequently is it required in the case of the fibula, the forearm bones, and the clavicle.

Exposure of Seat of Fracture.

The skin having been purified by a watery solution of phenol, the fracture is exposed through either a linear or a curved incision, which latter allows of a flap being raised. The linear incision is employed where the bone has a good covering of muscle—for example, the shafts of the humerus and femur, and the antero-lateral surface of the tibia. In these situations, as the retractors are removed the muscles fall together and separate the seat of fracture from the skin wound. The curved incision is found more suitable when the plate is to be applied to a subcutaneous area of bone—for example, the medial aspect of the tibia. In this situation a flap is desirable, and its replacement buries the fracture and the metal appliance away from the skin wound. In the case of the leg this incision lies for the most part over the soft tissues behind the inner border of the tibia: the horns alone extend forwards over the subcutaneous bony surface.

When Operation should be Performed.

It is advisable in simple fractures to operate as soon as possible after the skiagram has been obtained. If the operation be done early not only will the skin be free from possible vesication or ulceration, but the adjustment of the fragments will be comparatively easy. If interference be delayed the skin may have in the interval become septic, while the muscles will have become fixed, and their extensibility impaired by infiltration with exudate. When this has happened the adjustment of fragments may be fraught with great difficulty, and may require very forcible handling, either by an elevator or the more powerful Murphy's lever: in some cases—for example, the femur—overlapping fragments may be angled on one another and the bone then

straightened by manipulation. After coaptation the fragments may be held in position by Lane's forceps or Lowman's clamp till the plate is adjusted and screwed on.

In the case of a compound fracture one must play for safety, and in such I purposely delay plating till after the lapse of a few days, when it may be ascertained that asepsis has been secured.

Periosteum.

The periosteum should be incised and stripped off the area of the bone to which the plate is to be applied. This stripping not only removes the periosteum from hurtful pressure, but it allows the formation of more callus than would be likely if the plate were fixed down on the top of the periosteum. In fractures which have been plated there is a tendency to lessened formation of callus. This tendency is probably due to close coaptation and immobilization of fragments, and is a factor in the production of delayed or of non-union, when such occurs.

Plates and Screws.

The pattern which I have found most convenient is Lane's simple flat plate with straight parallel edges. As a rule I employ one with four holes: in some cases a three-hole plate suffices. The plate should be sufficiently pliable to allow of adjustment to a curve or angle in the long axis of the bone. I always use Lane's screws. It is said by some that the sharp thread of these screws does not give a secure hold on the bone, and Hey Groves (loc. cit., p. 177) gives it as his opinion that a screw used for dense bone ought to be of the engineer's variety. This opinion would seem to be based on the fact that this author expects that a plating operation should render the patient independent of external splints.

Splints.

I make it a rule to secure immobilization, so far as that is possible, by the use of external splints. My object in plating is merely to keep the fragments in accurate coaptation till the chance of displacement is over, after which I remove the plate and screws. Before going into the details of the removal of plates, I would just mention that in applying splints care should be taken that the limb be kept in such a position as will facilitate restoration of function after the fracture is healed. It seems almost superfluous to mention this; but I have, both in the army and in civil practice, frequently come across cases in the lower limb where insufficient attention to the position of the foot had led to crippling of an obstinate nature. When the time had come to discard the splints it was often found that the ankle had stiffened with the foot in the pointed position. Passive movement under an anaesthetic had frequently to be resorted to, and in some cases operative lengthening of the tendo Achillis was required before the foot could be restored to the position at right angles to the leg—a position which is essential to the patient who is beginning to walk again.

Removal of the Plate.

This is carried out as a routine, with the object of avoiding possible trouble in the future. I refer to pain in the bone, swelling of the bone and neighbouring soft parts, loosening of the screws, sometimes sinus formation, and occasionally even refracture. I am aware that some surgeons hold the opinion that if the operation has been aseptically performed such trouble is unlikely, if indeed it ever occurs. I regret that I cannot agree with such opinions; and I remove the plate when it has fulfilled its function as an internal splint—that is to say, during the third or fourth week. During the operation of removal I am accustomed[4] to find in the wound a great or lesser quantity of thick muddy fluid of dull greyish-yellow, sometimes greenish-yellow, colour. This fluid is usually struck between the bone and the plate, and if unassociated with a sinus or communication with the skin surface it has always been proved sterile on attempts at culture. It is also unassociated with any necrosis of the bone, and does not prevent aseptic healing of the reopened wound in the soft tissues.

At the operation of removal the screw nails may be found holding as firmly as when first introduced, or they may be loose enough to be picked out with dissecting forceps. The difference depends on the reaction of the bone to the presence of the foreign body. When they are loose I find as a rule that union of the fracture is proceeding satisfactorily. On the other hand, it seems to me that when they are holding firmly there is a deficiency or want of reaction on the part of the bone—in other words, that the bone is sluggish; and I am not surprised when in such cases I find delayed union. Of course it may be that loosely holding screws permit some movement of the fragments, with consequent increase of callus production; but such a view does not explain the loosening of the nails.

After-Treatment.

Splints are discarded about the end of the sixth week; and, in the case of the lower limb, a plaster-of-Paris support is applied and kept on for four to six weeks. Should it be found, in the case of the leg, that when splints are left off the union is not firm, my practice is to encase the limb from the toes to mid-thigh in plaster-of-Paris, with reinforcing wooden strips on inner and outer sides. The patient is then made to walk about with stiff knee. This ensures mild traumatism of the ends of the fragments, by no means a new device in the treatment of delayed union,[5] and usually succeeds in bringing about firm union. If, as rarely happens, this manœuvre be unsuccessful, comminution at seat of fracture is practised. For this purpose a chisel or osteotome is carried in long axis of the bone from the upper fragment through the weak union into the lower fragment.

Comminution for non-union has recently been recommended by Waring and Milligan.[6] These authors freshen the ends of the bone and expose the medullary canal before comminuting the bone. In the few occasions on which I have had to employ comminution I have simply used the chisel or osteotome as above described, and have found the procedure to give very certain and satisfactory results.

Conclusions.

1. Operative treatment should not be a routine, but properly reserved for cases where non-operative measures fail to secure restitution of fragments.
2. Temporary plating is in the case of the tibia, femur, and humerus a reliable form of internal splinting.
3. Skin incision should be placed so as not to be in immediate contact with the fracture.
4. With the object of encouraging the formation of callus, the periosteum should be reflected from the area to which the plate is to be applied.
5. Flat four-hole plates, bent if necessary to fit, and fixed with Lane's screws, give satisfactory results.
6. External splint support is necessary.
7. Plates and screws are removed in from three to four weeks.
8. Looseness or fixity of screws at time of removal is in proportion to reaction or sluggishness of the bone, and would seem to be an index to the progress of repair.
9. Plating does not prevent delayed or non-union.

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TREATMENT OF UNUNITED FRACTURES BY BRIDGE GRAFTS.

BY

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ANY discussion on the treatment of fractures is incomplete without reference being made to a class of fracture which has been brought to our notice by the late war, and to which the usual methods of treatment of recent fractures do not apply. I refer to those cases where there has been considerable loss of bone in addition to violent sepsis at the seat of fracture. In some of them as much as three or four inches of a gap has been made in the continuity of the bone, and the problem we have to face is the bridging of the gap. Most of these cases have been extensively involved in a septic process and not only the bone but the soft parts around are converted into scar tissue which encapsules micro-organisms. If a sufficient, and indeed a generous, length of time has not elapsed since the final healing of the soft parts, sepsis will flare up almost inevitably if operative procedures are attempted. I have had the opportunity of treating over

sixty of these cases, and I have learned some lessons which I desire to bring before the notice of the Section.

General Considerations.

In the first place these cases must have efficient and sometimes prolonged preliminary treatment of the scar tissue; and as far as possible deformities which have resulted from contracting scars must be corrected by suitable mechanical means.

I have had good results from complete excision of the scar and the use of pedicle or tubed skin grafts to fill in the area thus excised. This method serves two purposes: First, it shows whether latent sepsis is present in the tissues before operating on the bone gap; because if no flare-up occurs the gap can be dealt with as soon as the skin graft has healed. Secondly, it provides healthy skin through which to make the incision when the bone gap is bridged. I have used the tubed pedicle graft for shoulder cases and legs. Small scars are given a course of deep massage and ionization of two or three weeks' duration as a test for the presence of latent sepsis.

The operation for the bridging of the bone gap must be carried out with the most scrupulous care as regards asepsis. The bone scar tissue, if this has not been already removed when excising scar tissue in the soft parts, must be cut away widely until healthy bone is encountered, and if it can safely be attempted the removal of all scar tissue—soft parts and bone—should be done in one piece by block dissection. Ligatures should be handled and tied with forceps, and stitching of the soft parts also carried out with needle holder and forceps only—in fact, the gloves at the end of the operation should be free from blood stains, thus showing that they have not come into contact with any part of the wound edge.

I have tried the various methods recommended from time to time, all of which have had their advocates—namely, wedge, intramedullary, inlay, combined inlay and intramedullary, also stepping and comminution of the bone ends. My experience with these various methods is that I find, while success may attend the use in certain cases of any one of them, the greatest success has been with the inlay method or its modification the combined inlay and intramedullary method.

The Graft: Essentials for Success.

There are some essential points that emerge in connexion with the graft itself if success is to be attained. It must be long enough to overlap the gap by a wide margin at either end; the greater the overlap the better the contact with the host bone, and better blood supply is secured by the graft while union is being established. It must be thick enough to stand the strain of the natural pull of the muscles in the long axis of the bone; a cross strain favours non-union. While a graft denuded of periosteum will unite and grow it is better if the periosteum is not removed, as that membrane ensures a better blood supply to the graft through its capillaries linking up with the capillaries of the soft parts around. The periosteum also acts as a limiting membrane, preventing small outgrowths of bone from penetrating the surrounding parts; these outgrowths are not uncommonly seen in *x*-ray plates of grafts where the periosteum has been removed or has become stripped up during the grafting operation.

The contact with the host bone should be secure and as rigid as possible. While it is possible to secure rigidity by the use of absorbable suture material such as kangaroo tendon, this suture tends to soften too soon. I have not been able to satisfy myself of harm being done by metal suture, such as phosphor-bronze wire, which gives the necessary firm contact and retains its grip until union has taken place. It has been stated that wire interferes with the blood supply of the bone, but that is an unproved assertion, and if the graft be thick enough the wire cannot be tightened so as to strangle the whole thickness of the bone; in any case it need not be tightened more than sufficient to ensure contact.

Various Types of Graft.

The wedge-shaped graft is unsatisfactory because it is impossible to obtain sufficient contact with the host bone without splitting the host for a considerable distance; and also, if the wedge is to be thick enough, the spreading of the host bone at the base of the wedge makes a clumsy thickened boss of bone when union has taken place.

The inlay graft satisfies the requirements stated above in an efficient manner; it can be cut the required size so as to secure the proper thickness and length for the overlap. It can be neatly mortised into the host bone, and can be fixed with the rigidity necessary.

The intramedullary graft is easy to insert into one end of the host but a difficult matter at the other, and while one can get good contact with the first inserted end the second is not possible, and here non-union frequently results. The medullary cavity is often unhealthy, although the compact bone may appear fairly normal. In some cases I have seen, the compact tissue has been a mere shell enclosing soft semi-diffluent marrow, and the bone has frequently to be cut away for a considerable distance before tissue healthy enough to receive the graft can be found.

The thrust-graft modification of the inlay is a risky method to employ unless one is sure that sepsis will not flare up. If the case becomes septic then the pus may track up the whole length of the shaft of the two fragments.

I have given up the use of the purely intramedullary graft. The combined inlay and intramedullary is a very useful method, especially in the heavier bones where one wants thickness of graft. Where there is much deviation of the fragments from one another laterally, the fragment most out of alignment should be selected for the insertion of the intramedullary portion of the graft; the other end can then be contracted with the host bone by a long overlapping inlay.

Stepping is a method for use under certain circumstances. In the humerus it gives good results, but it necessarily shortens the arm, and if the gap is large the shortening may be very considerable. The other methods give quite as good results as regards union, without the disability of a short arm.

In flail-shoulder I have used a double graft between the glenoid and the humerus; this has given the requisite strength, and kept the arm of normal length, the patient being able to abduct the arm to a right angle by scapular action.

In the ulna non-union frequently occurs after grafting, and this probably happens in the majority of cases where there is a large gap near the upper end of the bone, and where the bone has not been kept as rigid as possible by apparatus during the healing of the septic wound.

Normally the radius in pronation and supination rotates through an arc, the centre of which is the line joining the upper and lower radio-ulnar joints—the so-called "bucket handle" action. When, however, the ulna is fractured in its upper third, especially if there is a gap between the fragments, the radius is drawn toward the upper fragment of the ulna by the contracture on the pronator radii teres and the flexor group of forearm muscles. The radius then rotates through its own long axis and the lower fragment of the ulna is carried to and fro with it; a joint is thus easily formed at the junction of the upper fragment of the ulna and the graft—at least the upper end of the graft is subjected to a lateral strain during healing instead of a longitudinal one. In these cases, when the graft has consolidated at the lower end and thickened throughout, a fairly useful arm results even although a joint remains at the upper end of the graft. When a case has reached this stage further operation should not be recommended.

In gap fractures of the tibia the sliding inlay or ordinary inlay graft gives good results. In some cases a portion of the fibula may be cut out and used as a strut, placed in the gap in the tibia.

After-Treatment.

The after-treatment of these cases is very important. The limb should be encased in plaster at the operation, in the best position as regards longitudinal strain on the grafted bone. A window should be cut in the plaster over the wound on the next day, for relief of pressure on the wound area and for future dressing if necessary; the window is filled in with plaster again as soon as the skin is healed. The plaster must remain undisturbed for at least two months or longer if necessary.

After the plaster has been removed the limb should be supported in a light apparatus, poroplastic or other mould, and muscle movements carried out, at first by massage and later actively, so that growth in the graft may be stimulated in accordance with Wolff's law. Sometimes union appears to be delayed for no obvious reason; in these cases a further period of rest in plaster and massage sometimes results in firm union without any further active operative procedure.

EXTRAPLEURAL THORACOPLASTY IN THE TREATMENT OF PULMONARY TUBERCULOSIS:

EXPERIENCES FROM 75 OPERATIVE CASES.

BY

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SINCE to-day, for the first time, I have the honour of reading a paper to the British Medical Association I am especially glad that it is possible for me to do so at Glasgow, for, as we all know, Glasgow was the cradle of modern surgery—it was here that Lord Lister began his famous experiments with carbolic acid in the treatment of wounds. His work finally led to such brilliant results that no surgeon in any country or in any period of history has rendered such great services to mankind. There is, however, another reason why it is specially gratifying for me to read a paper dealing with a branch of pulmonary surgery at Glasgow, and that is because in this city there lives Sir William Macewen, who performed daring operations on the lungs before the majority of other surgeons. If I might be permitted to express myself in this country in a German expression, I would say that Sir William is *der Altmeister* of all pulmonary surgeons.

In electing to speak of the importance of extrapleural thoracoplasty in the treatment of pulmonary tuberculosis, I do so because I suppose that I have, so far as I know, a greater experience in this domain than any British surgeon, for since 1914 I have operated upon 75 patients suffering from pulmonary tuberculosis. I cannot enter here into all the details connected with this subject, but I should like to draw attention to my paper in the *Lancet* of Octob r 16th, 1920, and to-day I shall give you a short general review of the indications, the technique of the operation, the after-treatment, and my results. To supplement this review I shall show a number of lantern slides, and I shall also demonstrate three patients who were operated upon with success three to four years ago, and who have crossed the sea with me to be shown to this meeting. It must be stated, however, that the operation in its present state of development was first planned by Brauer, at that time professor of internal medicine at Marburg, and that the technical development of the operation is mainly due to Friedrich and Sauerbruch. The operation was first performed by Friedrich in December, 1907.

Indications.

Extrapleural thoracoplasty belongs to the same category in the treatment of pulmonary tuberculosis as artificial pneumothorax; both aim at a collapse of the lung with resulting retraction on account of the increased development of connective tissue, and thereby healing. As, however, artificial pneumothorax is less risky than thoracoplasty, I demand as a rule that inflation shall have been employed either without result, or unsuccessfully on account of extensive adhesions, before the patient is advised to have thoracoplasty. On the whole it may be said that the indications for thoracoplasty coincide with the indications for artificial pneumothorax, and that the former should be employed when the latter cannot be used.

As regards the so-called "healthy" lung, it should be required that there are not, nor have been, demonstrable clinical symptoms in that lung, or that such symptoms in any case have quite disappeared, or, during a long period of expert observation, that they have remained stationary and of slight extent. Even though there may be little or nothing to find clinically in the "healthy" lung, it happens not infrequently that in the *x*-ray photograph we can find such extensive changes that an intended operation has to be abandoned. An *x*-ray examination of both lungs is therefore absolutely essential.

It must be strongly emphasized that this branch of surgery demands intimate co-operation between the surgeon and the physician in charge of the case. Best of all, the patient should be observed and treated at a special sanatorium before the operation. In the case of the sanatorium physician, who may be assumed by daily observations to know the patient thoroughly, there appear two difficult problems for solution: (1) Can it be decided whether any existing physical alterations in the "healthy" lung are due to a healed-up, a stationary, or a progressive process? (2) He must ascertain at an early stage the moment when he considers continued expectant treatment, including artificial pneumothorax, to be of any value for the patient's health. It is an easy matter to wait too long, so that when at last the patient is sent for operation large cavities have already developed in the lungs. Even if I have patients who, in spite of cavities as large as a hen's egg, or even larger, are still healthy from one to five years after the operation, there is no doubt that cavernous unilateral pulmonary tuberculosis gives a much more unfavourable prognosis as regards permanent cure after thoracoplasty than the infiltrating shrunken forms. Repeated haemoptyses should, in cases of doubt, hasten the decision to undertake thoracoplasty.

A slight tuberculosis of the larynx is not a contraindication of operation, as it may well be assumed that any further improvement in pulmonary tuberculosis, with diminished cough and expectoration, will have a favourable influence upon the laryngeal tuberculosis, in analogy with the improvement in a tuberculosis of the bladder after removal of a diseased kidney. Neither does tuberculosis in one kidney constitute an absolute contraindication; in the autumn of 1921 I removed the left kidney, and at the same time performed thoracoplasty on the same patient, who at the present time is doing very well. Absolute contraindications are found in an advanced stage of tuberculosis in the other lung, and the general contraindications which militate against any serious operation.

Technique.

The patient is placed upon the healthy side, with a large sandbag beneath, in order to press forward the diseased side. I have always performed the operation by the aid of the hook-shaped Sauerbruch incision. The arm is drawn outwards and the skin and muscles are cut down to the lumbo-dorsal fascia. The scapula with the covering soft parts can then without difficulty be lifted out from the thoracic wall, and it is then possible to remove as large portions of the ribs as may be desirable. The question is now, which ribs to remove and how much of them. As the object of extrapleural thoracoplasty is not only to get the lung to collapse, but also to put the diseased lung out of function, the resection must include many ribs. Even if the infection of the lung is limited, the resection of the ribs should proceed far beyond the diseased part of the lung; indeed, it may well be said that extrapleural thoracoplasty has developed into a typical operation, in which resection is always made from the tenth to the eleventh, up to and including the first rib.

It is sufficient to resect 6 to 7 cm. of the eleventh rib, 12 cm. of the tenth and ninth, and 15 cm. of the following ribs up to and including the fourth; of the three uppermost as much as possible is taken, which in general will be 12 cm. for the third, 10 cm. for the second, and 2 to 3 cm. for the first rib. The total amount of the resected ribs thus amounts to about 120 cm., varying from 90 to 180 cm. I have resected about a hundred yards of ribs from my 75 patients.

An extremely important point in costal resection is that the ribs ought to be resected as far back as possible—that is to say, far beyond the costal angle, right up to the costal tubercle, and the point of the transverse process. It is almost thirty years since the Frenchmen Boiffin and Gourdet emphasized how important it is in the treatment of chronic empyema to remove the posterior parts, which are the stiffest and most curved part of the ribs; if we remove only the posterior part, the anterior part of the ribs, on account of the flexible costal cartilage, will easily be pressed inwards towards the thoracic cavity and the costo-vertebral angle will to a large extent be effaced. It is this principle in costal resection which has now been transferred to extrapleural thoracoplasty.

When, after having resected the ribs lying below, I reach the fourth or the third rib, I always perform apicolysis—that is to say, after resection of the fourth or third rib I make an incision through the periosteum and the endothoracic fascia; you can now with the finger, without difficulty, loosen the top of the lung from the thoracic wall, so that between the lung and thoracic wall there arises an extrapleural cavity larger than a hen's egg. If there are then cavities in the apex, we may sometimes both see and feel how they collapse. If apicolysis has been performed, resection of the two upper ribs, the most difficult part, from a technical point of view, of the operation, will proceed more easily since it is then unnecessary to entertain any fear of injuring the lung. In order as far as possible to avoid the contents of the cavity being forced into the bronchi, it is necessary for the patient on the morning of the day of operation to cough up as well as he can all the contents of the diseased lung.

Resection of the first rib may be somewhat troublesome. In order to facilitate this I have modified the usual Doyen's costal raspiratory, so that the effective part of the instrument does not cut vertically in relation to the handle, but coincides with the axis of the latter.

The muscles and skin are each sewn up separately. A large glass drainage tube is placed in the lower posterior angle of the wound, although I have sometimes entirely closed the wound without any disadvantage. The bandage must be supported by three broad strips of plaster, running horizontally, so that the thoracic wall, which has been mobilized by the operation, may not give way too much to the shock of coughing during the first few days after the operation.

It may be difficult to get cavities in the apex to collapse by thoracoplasty alone. I have on twelve occasions performed (by the method of Tuffier) free transplantations of subcutaneous fat, first resecting the third or preferably the fourth rib in the axilla, and then performing apicolysis from the place of resection. In the extrapleural space, larger than a hen's egg, thereby created, there is then placed a large piece of fat taken from the anterior abdominal wall. In one case I used with good results half of the right breast instead of fat; in another case recently operated upon, after resection of the anterior parts of first to the fourth ribs, I loosened the lung from the thoracic wall and pushed the pectoralis major and minor muscles into the cavity, after having severed their attachment to the humerus and the coracoid process respectively.

The next important question is: Shou'd the operation be performed in one or two stages? I have tried both ways, and my experience shows that two stages are less risky than one. In 54 cases I planned to complete the operation in two stages. It happened on two occasions that the second stage of the operation was not performed, because the patient's general condition was too bad. Two patients died after the first stage of the operation, but 50 survived both stages—a mortality of about only 4 per cent. Of 21 patients where the operation was performed in one stage, 6 died—a mortality of about 30 per cent. I must therefore advise those who desire to try these operations to perform the first of them at any rate in two stages.

In performing the operation in two stages, the cut in the second stage is much higher up than in the first and proceeds downwards to about angulus scapulae and from thence farther forward. In the operation in two stages I resect ribs eleven to six or five costal in the first stage, and five or four to one in the second stage. As a rule from two to three weeks should elapse between each stage of the operation. On the other hand, I have sometimes obtained good final results when I have been obliged to postpone the second stage of the operation for many weeks, because the general condition of the patient did not permit the operation to be performed before.

Should general or local anaesthesia be employed? Most of my patients have been operated under local anaesthesia, but by degrees I have more and more resorted to general anaesthesia and I am astonished to find how well on the whole my patients stand this.

Course of the Disease and After-Treatment.

During the operation the pulse rate often rises to 120 or 130 or even more, and the respiration rate to 40. When the patient has been put to bed again, the pulse and respiration usually improve quickly. In some cases the pulse does not rise to more than 80 or 90, the respiration to more than 26 or 28. Some patients vomit during the operation.

Immediately after the operation we observe a marked collapse of the thoracic wall with paradoxical respiration, the mobilized part of the thoracic wall being drawn inwards during inspiration and pushed outwards during expiration. Dyspnoea, troublesome expectoration, and pains in the chest, radiating to the shoulder and upper arm, especially trouble the patient during the first days after the operation. The dyspnoea is partly due to "mediastinal flutter," partly to the laboured action of the heart on account of the displacement. The heart has to grow accustomed to the latter before it can act normally.

Expectoration must be relieved. This is done in various ways. An extra nurse remains with the patient day and night in order to support the operated side during attacks of coughing, and in order to encourage him to expectorate. A good compressing bandage is of importance both as regards the cough and in order to produce collapse of the operated side. But above all it is important to give the patient sufficient narcotics, morphine or omnopon, in order to relieve pain and thereby facilitate expectoration, and moreover narcotics have a beneficial influence upon an eventual "mediastinal flutter."

The amount of sputum diminishes often while the patient is still in hospital, and in a number of cases it diminished in the course of a few weeks from 150 grams in twenty-four hours to 30 or 25 grams or even to zero. As a rule a rapid diminution in the amount of sputum is a good but not completely reliable prognostic sign. At the same time that the amount of sputum diminishes the number of tubercle bacilli also diminish. Frequently on a patient's discharge from hospital we may find only a few or even none, even if on his arrival at the hospital his sputum swarmed with tubercle bacilli.

The temperature often remains high and the pulse frequent for four or five days, but in cases progressing favourably it then falls to about normal; at the same time the pain also diminishes considerably. The patient soon begins to feel better, and is especially gratified because the cough is so much less troublesome. The large wound almost always heals by first intention, and the patient, even two or three weeks after the operation, can begin to sit up, or if the operation has been performed in two stages five or six weeks after the first operation.

The operated side of the thorax falls in considerably, so that the anterior margin of the scapula can be seen from the front. With the cystometer we can measure a diminution of the operated side amounting to 5 or 6 cm., or up to 10 cm. We can feel distinctly how the anterior ends of the resected ribs approach the posterior ones, so that the distance between them decreases from 12 to 15 cm. to 5 or 6 cm., 3 or 4 cm., or even less. At the same time the anterior ends move downwards, so that, for instance, the anterior end of the seventh rib rests opposite the posterior end of the eighth rib.

There develops scoliosis of the spinal column with the convexity towards the diseased side—the reverse of the post-empyemic scoliosis—presumably because at the operation we cut or paralyse a larger or smaller part of the long back muscles; the muscles on the healthy side therefore gain the supremacy so that the spinal column is bent convexly towards the operated side. The mobility of the arm is at first greatly restricted on account of pain, but by degrees it returns, except where the scapula has been entirely fixed. On the whole it may be said that the permanent inconveniences of the operation *per se* are slight.

After-Treatment.

When the patient is discharged from hospital he is sent back to the sanatorium in order to undergo the necessary after-cure for at least three or preferably six months. In favourable cases improvement continues there, evincing itself by a constantly diminishing amount of sputum, the fall of the temperature right down to normal (if it has not done so before), improved appetite, increase in weight, and better spirits. In order to judge whether the patient has derived any benefit from the operation we must lay some stress upon whether the amount of expectoration diminishes, whether the tubercle bacilli disappear, or see whether the temperature remains normal or increased, and last, but not least, we must pay regard to the patient's general condition. On the other hand, the physical conditions of the operated lung are so difficult to determine after the operation that very frequently they cannot be given any appreciable importance. If prior to the operation there were marked symptoms of cavity formation, we may, in favourable cases, be able to find that the metallic and amphoric breathing are replaced by crepitations, with or without bronchial breathing. But all abnormal sounds do not disappear; weak amphoric breathing may be found even though it was lacking before, and is due to the large bronchi, which pass through a stiff, retracted pulmonary tissue. Even in the very best cases we never achieve normal physical conditions in the operated lung. The percussion sound continues to be subdued, in some places very faintly tympanitic, at others quite dull. Abnormal respiratory sounds may be heard, because both lung and thoracic wall have lost their elasticity, so that it is difficult for the lung to get rid of expectoration. Therefore a slight cough and meagre expectoration without tubercle bacilli, in connexion with the above physical changes, cannot be taken to be bad signs, provided that the general condition, temperature, and pulse of the patient are satisfactory.

CONCLUSIONS.

Between May 1st, 1914, and June 1st, 1922, I performed 75 extrapleural thoracoplastic operations for pulmonary tuberculosis. Of those operated upon 37 were men and 38 women. The operation was performed 46 times on the left side and 29 times on the right side. With regard to men the operation was performed 20 times on the left side and 17 times on the right side. With regard to women the corresponding figures are 26 and 12. Of these, 8 (3 women and 5 men) died from the operation; 7 when the disease was in the right lung, 1 when in the left. Thus I have had, out of 46 cases of left-sided pulmonary tuberculosis, 1 death from operation, and out of 29 right-sided cases 7 deaths.

Results of 75 Extrapleural Thoracoplasties.

Year.	Number.		Dead, 29.			Still Alive, 46.		
	Men.	Women.	From Operation.	From Tuberculosis.	From Other Causes.	Symptomless and Able to Work.	Tuberculous.	Result not yet Fixed.
1914	1	4		3		2		
1915	2	2	2	2				
1916	1	3	1	3				
1917	3	11	1	7	1	4	1	
1918	4	2		1		3		2
1919	6	6	1	1		7	2	1
1920	5	5		3		2	4	1
1921	10	4	1			7	2	4
1922	5	1	2					4
	37	38	8	20	1	25	9	12
	75							

Several of the deaths took place with the same clinical appearances; one or two days after the operation the temperature rose to 102.2° or 104°, the pulse rate to 120 or 140 or more, and remained so until death, after the lapse of four to eight days. In one case a patient died the following morning, with a temperature of 106°. These patients had usually no dyspnoea, and the tongue remained moist. At the *post-mortem* examination there were found small submucous haemorrhages in the stomach and duodenum, and flabby cardiac muscles, but otherwise nothing to explain the cause of death. This is regrettable, for it has happened several times that precisely in these fatal cases the operation passed off particularly well, the patient has not been visibly affected, and we considered ourselves justified in entertaining the highest expectations; then fate suddenly delivered one of those unexpected blows which to a special degree it seems to have reserved for us surgeons. If, therefore, we could find a method which could tell us in advance which patients it would be dangerous to operate upon—a test, for instance, of the same value as the determination of the quantity of urea in the blood of kidney patients—much would be gained. We could then hope to take away much of the ominous character which still surrounds thoracoplasty. It is in that direction that we are at present carrying on investigations at my clinic in Christiania, although I am unable to say as yet whether we shall succeed in obtaining any useful results.

What is the fate of those patients who survive the operation? To judge of this it is necessary, in any case, to wait at least until one year after the operation, and it is preferable, as in the case of cancer, to wait for three years. Sixty-four of my patients have been under observation for more than one year, up to eight years, after operation. Thirty-eight (59 per cent.) are still alive, 26 are dead. Twenty-five (39 per cent.) are alive and have no symptoms and are more or less able to work; 9 are tuberculous; and in the case of 4 the result is not decided. Of the 26 deaths 5 were due to the operation, 20 to tuberculosis, and 1 to influenza. Thirty-seven patients have been observed for more than three years, up to eight years, after operation; 16 (43.2 per cent.) are alive, of whom 12 (32.4 per cent.) have no symptoms and are more or less able to work; 1 has tuberculosis, and in the case of the other 3 the results remain to be seen; 21 died, 4 through the operation, 16 of tuberculosis and 1 of influenza.

These results show that the danger to the patients lies in a new outbreak of tuberculosis in the other lung, and, further, they agree to a considerable extent with the results of our operations for cancer, resembling especially, as far as my own cases are concerned, the statistics of the operative results of cancer of the rectum. The immediate mortality resulting from the operation is 10 per cent. and the number of cures after three years' observation amounts to one-third. As the years pass more and more of the patients die of the original disease: cancer patients of recurrence or metastases, phthisis patients of tuberculosis in the lungs or elsewhere. Just as unexpected cases of recurrence or metastases can be met with in cancer patients several years after the operation, I have, after thoracoplasty, met individual cases where patients can be for three to four years without cough or tubercle bacilli until one day they die on account of a new outbreak of tuberculosis in the other lung.

Discouraged by the results of our cancer operations, we make a point of impressing upon practitioners that the diagnosis must be made earlier so that patients may come up sooner for the operation. An improvement of the results of extrapleural thoracoplasty is, on the other hand, not a question of early diagnosis, but, as mentioned before, a question of early correct prognosis. Just as an early diagnosis cannot save all cancer patients, no more can an early correct prognosis save every case of unilateral pulmonary tuberculosis. As long as we have no specific against cancer and tuberculosis there will always be, in spite of our best efforts, a number of patients for whom our science can do nothing. We must not give in, however; the more doctors who work in the same direction, the greater are the prospects of obtaining better results from all operations, including thoracoplasty.

Since I commenced to perform these operations in Norway eight years ago several of my colleagues have followed suit. In all 67 thoracoplastic operations have been performed in Norway by other surgeons, with only 6 deaths following the operations; in other words, rather better results than I can show. I have come over here on purpose to interest my British colleagues in this work, and I do not doubt that with their well-known energy and fund of common sense they will make valuable contributions to this branch of medical science.

The concluding points which I wish to make are as follows:

1. In unilateral or mainly unilateral pulmonary tuberculosis which is not cured by rational expectant treatment or pneumothorax, good results can be achieved by means of extrapleural thoracoplasty.

2. The operation should only be performed after an exhaustive conference with the physician treating the patient, who must have been enabled, by observation during a considerable period, to form a considered opinion of the prognosis with continued expectant treatment.

3. Resection of the ribs should be carried out, under local or general anaesthesia, through a paravertebral incision so that the posterior part of the ribs from the eleventh, or in any case from the tenth, to the first inclusive can be removed.

4. If a cavity remains, it can be brought to collapse by means of intrathoracic transplantation of fat.

5. It is necessary that medical practitioners should acquire knowledge of the indication and results of extrapleural thoracoplasty. As one can rely upon saving one-third of the patients who, without the operation, would be doomed no doctor has now the right to withhold the chance of operation from suitable patients.

CHRONIC DUODENAL ILEUS.

BY

D. P. D. WILKIE, M.CH., F.R.C.S.,

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THE duodenum may without doubt be regarded as the most vitally important segment of the gut. We know that a duodenal fistula is associated with rapid wasting and tends to be fatal if not promptly dealt with. A complete obstruction of the duodenum, such as occurs in the condition generally known as acute gastro-mesenteric ileus, is followed by very striking symptoms of shock and collapse, and, if unrelieved, quickly ends in death.

Anatomically the duodenum occupies in the greater part of its course a secluded retroperitoneal position, owing to the rotation of the gut in foetal life. This rotation of the gut

has the effect of bringing the superior mesenteric vessels to lie athwart the terminal part of the duodenum, so that the latter passes, as it were, under a bridge, the arch of which is subject to variation of level according to the tension on the mesentery of the small intestine and proximal colon. If the rotation of the gut were constant in its manner and degree, and if the support of the viscera by the tone of the abdominal wall were a constant and standard factor, then this retromesenteric course of the duodenum would present no peculiar difficulties or abnormalities. It is common knowledge, however, that the rotation of the gut is subject to frequent abnormalities, that the fixation of the proximal part of the colon is likewise subject to great variation, and that the support of the abdominal viscera is a factor prone to the greatest variation of all. Consequently it is no matter for surprise that the duodenum should under certain circumstances be exposed to compression and obstruction where it courses behind the root of the mesentery. Does such compression, short of the acute, complete, and fatal form, give rise to any recognizable symptoms? Is there, in fact, such a clinical entity as chronic duodenal ileus, and if so is it susceptible to surgical treatment? These are the primary questions with which I propose to deal.

The appreciation of any pathological condition almost necessarily begins with a recognition of its grosser forms. These once established, we are in a position to appreciate the lesser degrees of the same process.

My experience of this condition dates from the case of a woman, aged 54, operated on by me in the wards of our President (Professor Alexis Thomson) in the Royal Infirmary, Edinburgh, in which acute and fatal duodenal ileus from compression of the third part of the duodenum by the superior mesenteric vessels followed on symptoms of flatulent dyspepsia and vomiting. Since then I have had a second fatal case in a young man in whom repeated attacks of bilious vomiting culminated in a final and fatal attack. The patient was seen when in a practically moribund condition, and he died on the table as the abdomen was being opened. An opportunity was thus given to fix *in situ* the striking pathological appearances, and these are well brought out in the drawing made at the subsequent *post-mortem* examination. (Fig. 1.)

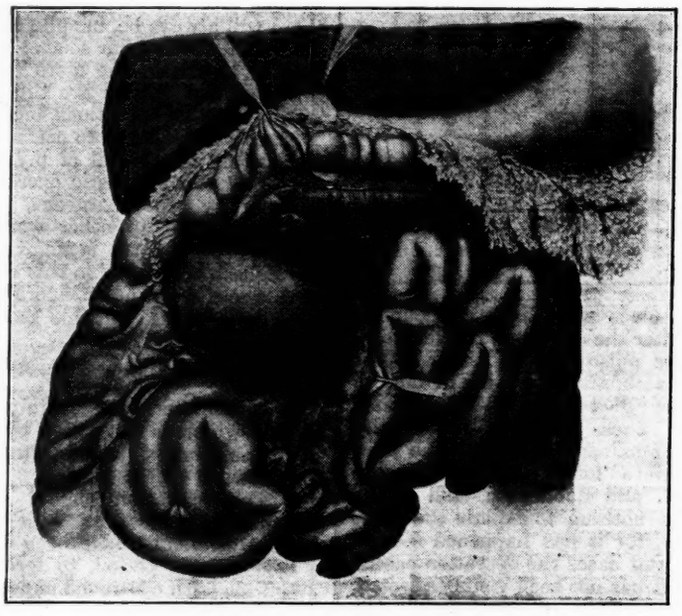

FIG. 1.—*Post-mortem* appearances in fatal case of chronic duodenal ileus. Transverse colon pulled up, showing greatly dilated third part of duodenum.

Apart from these two fatal cases I have now encountered 27 cases in which this condition gave rise to symptoms which had persisted in spite of medical treatment and were sufficiently pronounced to call for surgical interference. Before entering into any analysis of these cases it will be well to look at the clinical picture in this condition.

Symptomatology.

The patient is usually a female who complains of flatulent dyspepsia—for example, of pain or discomfort in the epigastric region coming on from one half to two hours after meals, associated with a feeling of distension. The latter may be so pronounced that she may have to loosen her clothes to get ease. She further complains of headaches, nausea, loss of appetite, and constipation. She will usually state that for years she has been subject to bilious attacks lasting for one or two days and characterized by headache, nausea, and bilious vomiting. Such attacks usually give a temporary relief from the other symptoms.

According to the age of the patient—and she may be of any age—she will date back her trouble for many years, usually to school days, although there may have been intervals, sometimes amounting to years, of relative freedom. The acute crises or bilious attacks may be altogether absent, and the patient's complaint is merely of chronic epigastric discomfort and distension after meals with possibly loss of weight. Occasionally pain is a prominent feature, and the explanation given by Leveuf that in such cases a tonic pylorus resists regurgitation into the stomach is probably correct. When the pylorus relaxes the pain ceases, vomiting follows, and relief is obtained.

Sometimes the picture may be somewhat obscured by secondary developments—for example, by symptoms of duodenal or gastric ulcer or those of gall stones, conditions which tend to complicate chronic duodenal ileus. In pronounced cases the great loss of weight and almost cachectic appearance of the patient may suggest gastric carcinoma.

The neurasthenic state which is apt to supervene in long-standing cases may make the assessment of symptoms a matter of considerable difficulty. The long-standing history is, however, always suggestive, and if the patient volunteers, as several of mine have done, that the only way to obtain relief from this discomfort is by lying on the face or adopting the genu-pectoral position, then a strong suspicion of duodenal ileus is warranted.

When an acute crisis supervenes the patient may rapidly pass into a critical condition, characterized by sunken eyes, rapid pulse, and distension of the upper part of the abdomen. The prompt recognition of this is of the utmost importance, as the extreme dilatation of the stomach may lead to paresis of its musculature, vomiting may cease, and death ensue.

Physical Examination.

This may be entirely negative, but may reveal obvious epigastric distension or a large splashing stomach. In two cases I have elicited splashing in the duodenum to the right of the umbilicus, but this is exceptional. Some tenderness will usually be found just above and to the right, and also in some cases just above and to the left of the umbilicus. Evidence of a general visceroptosis or of a low ballooned and gurgling caecum will frequently be present.

X-ray examination will offer the most convincing proof of the presence of duodenal obstruction. To be of value, however, the examinations must be made at repeated short intervals after the bismuth meal, and in various attitudes. If made when the patient is complaining of symptoms, the radioscopic findings will not fail to be of value; made during a period of freedom from symptoms, they may be altogether negative. As a rule, the stomach is seen to be low and dilated, the duodenal cap greatly enlarged and showing a soup-plate retention. The second part of the duodenum throws an abnormally dense shadow, is enlarged, and frequently shows evidence of antiperistalsis. In the milder cases the third part of the duodenum may not show clearly; in the more severe cases it is a striking feature. There may be, in addition, definite signs of the presence of a gastric or duodenal ulcer, or of the entry of bismuth into a dilated common bile duct.

Complications of Chronic Duodenal Ileus.

Sufficient has been said already to indicate what these are. Chronic stasis in the duodenum must be regarded as a factor predisposing to duodenal ulcer. By this I do not mean that in the majority of cases of duodenal ulcer a duodenal ileus is present, for it is not. What I have found, however, is that in quite a fair proportion of patients suffering for many years from symptoms of duodenal obstruction a duodenal ulcer eventually develops with its own typical symptoms. In six cases I have found this combination; in one of these a gastro-enterostomy relieved all symptoms. In two no relief followed

Synopsis of 21 Cases of Chronic Duodenal Ileus Treated by Duodeno-jejunostomy.

No.	Sex.	Age.	Duration of Symptoms.	Pain.	Vomiting.	Bilious Attacks.	Loss of Weight.	Previous Operations.	Operative Findings.		Result of Operation.	Remarks.
									Dilatation of Duodenum.	Other Conditions.		
1	F	38	Yrs. 20	+	+	+	2 st.	—	+++	—	Immediate relief	One year after some pain under the costal margin.
2	F	44	7	—	++	+	—	—	++	Cholecystitis and gall stones	Cure	No vomiting since operation.
3	F	35	21	+	+++	+	14 lb.	Two gastro-enterostomies, Roux's Y	++	Two old gastro-ent. blind loop com. with stomach	Greatly improved	Case much complicated by previous operations.
4	F	54	35	++	+++	+	36 lb.	—	++++	Gastric ulcer	Complete relief	Gained over 2 st.; can eat anything.
5	F	55	15	+	+++	+	14 lb.	—	+++	—	Relieved	Some acidity for 6 months, then rapid improvement.
6	F	39	8	+	++	—	slight	Ventral fixation, oöphorectomy, appendec. colopexy	++	—	Greatly improved	Vomiting ceased, and put on weight.
7	F	26	14	+	+++	—	*Nil*	—	++	—	Greatly improved	No more vomiting, seen 10 months after operation, in very good health.
8	F	36	8	+	+++	+	14 lb.	Cholecystectomy, appendectomy	++	Cholangitis, stenosis of common duct	Greatly improved	Cholangitis not completely relieved, required further operation on common duct.
9	F	61	40	+	+++	+	28 lb.	—	+++	—	Complete relief	Steady gain in weight after operation.
10	M	32	12	—	+++	—	30 lb.	Gastro-ent., adhesions, g.e. enlarged	+++	Old duodenal ulcer	Partial relief	Symptoms persisted; jejunal ulcer at gastro-enterostomy later resected.
11	F	40	22	+	+++	+	—	—	++	—	Complete relief	
12	F	25	8	+	+++	+	3½ st.	Appendectomy	++++	Great dilatation of stomach	Great relief	The most pronounced case met with.
13	F	23	9	+	+++	+	1 st.	—	+++	Gall stones in gall bladder and common duct	Immediate and complete relief	Rapid and complete recovery.
14	F	61	22	+	+	+	2 st.	—	+++	—	Complete relief	A very poor emaciated subject.
15	M	42	5	+	+	—	2 st.	—	++	Duodenal ulcer with stenosis	Cure	Rapid gain in weight.
16	F	32	8	++	+++	—	7 lb.	—	++	Appendix	Entirely relieved	
17	M	49	2 mths.	—	++	—	2 st.	—	+++	Carcinoma of stomach, infiltration of mesentery	Greatly improved	Previous to operation 48 hours' gastric retention; after operation empty in 6 hours.
18	M	29	3	++	++	+	20 lb.	—	++	Duodenal ulcer with stenosis	Complete relief	Gained weight very rapidly after operation.
19	M	35	13	+	++	+	12 lb.	—	+++	—	Complete relief	The hypertrophy of the duodenal wall was noteworthy.
20	F	49	33	+	++	—	2 st.	—	++	—	Complete relief	Immediate improvement in general condition after operation.
21	M	44	15	—	—	—	7 lb.	—	++	Hepato-colic lig.	Striking improvement	Dilatation of stomach and flatulence the prominent symptoms.

Note.—In addition to the duodeno-jejunostomy other operative procedures were necessary in some cases—for example: Case 2, cholecystectomy; Case 3, removal of old gastro-enterostomies; Case 8, choledochostomy; Case 13, cholecystostomy and choledochostomy; Cases 15 and 18, posterior gastro-enterostomy; Case 16, appendicectomy; Case 21, division of hepato-colic ligament.

a gastro-enterostomy, and in one of these a subsequent duodeno-jejunostomy effected a cure. In two cases complete freedom from all symptoms followed the combined operations of gastro-enterostomy and duodeno-jejunostomy.

In one case the patient died with unusual rapidity after the perforation of the ulcer. In one case of very pronounced and old-standing duodenal ileus in which the patient was wasted and cachectic and had latterly suffered from constant severe boring pain in the back there was found at operation, in addition to an enormously dilated duodenum, a chronic ulcer of the lesser curvature of the stomach. Using this as a test case the ulcer was left untouched and merely a duodeno-jejunostomy performed. The patient was immediately relieved of all pain as well as her distension and flatulence, rapidly gained 2 st. in weight, and from being a chronic invalid is now in good health fifteen months after the operation. As might be expected, chronic stasis in the duodenum with recurring catarrhal and obstructive attacks which so often accompany it is not infrequently associated with trouble in the biliary passages. The relative frequency with which post-operative acute gastro-mesenteric ileus followed on operations on the biliary tract suggested the possibility of a preceding chronic duodenal obstruction. The coincident occurrence of vomiting and escape of duodenal content through the opening in the common bile duct after an operation for the removal of a stone from that duct, a condition of which there are several cases on record and of which I have personally encountered one case, points again to the presence of duodenal obstruction.

The similarity in the symptomatology of the two conditions makes it frequently a matter of great difficulty to say whether a case is one of gall stones, of duodenal ileus, or of both. I have had to deal with three cases where the two conditions were combined in such obvious degree that the adequate handling of the case appeared to demand the treatment of both. In one case duodeno-jejunostomy was combined with removal of gall stones and cholecystostomy, in the second with removal of bile sand from and drainage of the common duct, in the third with cholecystostomy and with choledochostomy, stones being present in both gall bladder and common duct.

In none of these cases did the simultaneous performance of a duodeno-jejunostomy appear to add appreciably to the risk of the operation, and the convalescence in all was unusually smooth and rapid. In the case where stones were present in a dilated common duct it was of interest to note that a large gall-stone scoop and even the tip of the index finger could be passed readily through the common duct into the greatly dilated duodenum. The resemblance to a dilated ureter opening into a chronically dilated bladder was noteworthy.

A complication which must be mentioned is the presence of a previously performed gastro-enterostomy with symptoms suggestive of vicious circle. I have dealt with two such cases, and in both after removing the gastro-enterostomy performed a duodeno-jejunostomy.

Treatment.

For the milder cases treatment on medical lines may suffice. As visceroptosis is so frequently associated with the condition treatment directed to support the abdominal viscera, tone up the abdominal wall, and obviate constipation, is indicated. Most cases, however, are not diagnosed until the condition is so pronounced that treatment on the above lines would prove ineffective.

Surgical measures will aim at relieving the obstruction either by removing it or short-circuiting it.

If the obstruction be due to a drag on the mesenteric vessels from a mobile and prolapsed proximal colon, it may be relieved by fixing up the caecum and ascending colon. In two cases in which this seemed to be the factor operative, I obtained satisfactory results by colopexy. In the majority of cases, however, the colon is not mainly at fault but the tension on the mesentery appears to be due to the prolapse of the small intestine. The typical appearance in these cases is to see all the small intestines lying below the sacral promontory. Only with difficulty can they be dislodged, and they come out of the pelvis with a dull pop.

For such cases and for those in which the obstruction is due to a thickening and infiltration of the root of the mesentery either by chronic inflammatory, tuberculous, or malignant disease, much the simplest and surest treatment is to short-circuit the obstruction by performing a duodeno-jejunostomy—that is to say, by anastomosing the third part of the duodenum just proximal to the obstruction to the first coil of jejunum just beyond it. This operation is by no means difficult to perform in the type of case requiring it, involves little risk, has a surprisingly smooth after-course, and gives the most gratifying results. In order to demonstrate the condition at operation a stomach tube may be passed and the stomach inflated. The degree of duodenal dilatation and obstruction will then be evident.

I have now performed the operation in 21 cases with uniform success, and have been struck repeatedly by the immediate relief which it gives. Within twenty-four hours of the operation the patients express themselves as feeling relieved of symptoms which they have suffered from for years, and their progress is usually uninterrupted.

It would be out of place here to enter into technical details of the operation. It will suffice to say that efficient mobilization of the third and the lower end of the second parts of the duodenum is the secret of easy anastomosis. Although not covered by peritoneum the duodenum unites without difficulty, and I now use only the finest catgut for the anastomosis. The use of a special angled clamp simplifies the operation, but is by no means essential. When the operation is combined with a posterior gastro-enterostomy in cases of stenosing duodenal ulcer along with duodenal ileus, the duodeno-jejunal anastomosis should be planted on the jejunum about six inches beyond the gastro-enterostomy. Where an operation on the biliary tract is necessary the duodeno-jejunostomy should be done first to avoid the possibility of contaminating the subcolic area. The immediate results of this operation have in my experience been most encouraging. Apart from rupture of the abdominal wound owing to taking out through-and-through stitches too early, I have seen no post-operative complication and I know no other major abdominal operation followed by so smooth a course.

It is perhaps too early to speak of ultimate results, but in some of the most severe cases the results have been remarkable, the patients rapidly putting on two stones or more in weight, losing all nausea and flatulence and enjoying health such as they could not remember ever having had before.

In all cases improvement has followed, and so far I have encountered no complication peculiar to the operation comparable to jejunal ulcer following gastro-enterostomy.

The table (p. 1221) gives a synopsis of the 21 cases treated by duodeno-jejunostomy.

The operation of duodeno-jejunostomy was first suggested by Barker in 1906 and was first performed by Stavely[1] in 1908. Within the past two years numerous cases have been recorded and important papers on the subject have been published by Kellogg,[2] Leveuf,[3] and Duval and Gatellier.[4]

REFERENCES.

[1] Stavely, *Surg., Gyn., and Obstet.*, xi, p. 288. [2] Kellogg, *Ann. of Surg.*, May, 1921, p. 578. [3] Leveuf, *Rev. de Chir.*, 1920, No. 11, p. 616. [4] Duval and Gatellier, *Arch. des Mal. de l'Appareil dig. et de la Nutrition*, 1921, tome xi, 145.

DISCUSSION.

Mr. L. A. DINGLEY (Wednesbury) said how grateful he was to Mr. Wilkie for his publication of the paper on chronic gastro-duodenal ileus in the *British Journal of Surgery* in October, 1921. Up to that time he had not been aware of this condition except in so far as it occurred following surgical operations, and then in the acute variety. Since the appearance of this paper he had seen three cases, one following a miscarriage, the other two occurring in patients without any immediate cause. He stated that the three cases gave the typical history as given by Mr. Wilkie, a history of flatulent dyspepsia for many years with the sudden onset of signs and symptoms of acute obstruction high up in the alimentary tract. Two of the cases certainly, and one probably, had suffered from previous acute attacks. The physical signs were as follows: The patient was usually a woman with rapid pulse, normal or subnormal temperature, vomiting, either bilious or faecal in character, with absolute obstruction. The abdomen was greatly distended in its upper half, resonant, and giving a stomach splash, whereas there was no distension on the flanks or lower part of the abdomen. On auscultation and percussion there was a resonant band occupying the whole of the upper half of the abdomen, which on the right side often took an acute bend in a downward direction for two or three inches. Peristalsis could frequently be seen from left to right, and one case showed a contraction giving the appearance of an hour-glass stomach. Mr. Dingley especially wished to draw the attention of all medical men, especially general practitioners, to that little known condition because by immediate treatment by the medical man who first saw the patients many lives might be saved. The treatment was very simple and was usually effective if carried out early. It consisted in placing the patient in the left lateral or knee-elbow position for several hours after drawing off the stomach contents with a stomach tube. After the acute attack had subsided the question of operation as suggested by Mr. Wilkie should be discussed.

Sir KENNEDY DALZIEL (Glasgow) described a case seen in consultation with the late Professor Samson Gemmell of Glasgow sixteen years ago, in which he recognized ballooning of the duodenum; the patient had been vomiting bile for ten days and was beyond operative help when seen by him. From that time he had been aware of the condition described by Mr. Wilkie. He had never dreaded it where there was no pathological change, but he agreed with Mr. Wilkie that sometimes they found old tuberculous glands which so thickened the mesentery that a by-pass had to be made. Mere pressure of small intestine would turn the scale against peristaltic action of the duodenum and acute dilatation. This condition of acute dilatation of the duodenum occurred sometimes and no operation was necessary; if there was no organic change in the mesentery he questioned if the formation of a by-pass was required. A Curtis belt often relieved, not so much because it pushed up the stomach, but because it aided and supported the whole intestine and prevented traction in the duodenum.

Mr. WILKIE, in reply, said that the point of greatest interest was that of vomiting after abdominal operations as an aggravation of the tendency to duodenal obstruction. It was thought by some to be paralytic, but the treatment, by passing a stomach tube and turning the patient on his face, made it evident that pressure was occurring on the duodenum. In several cases where the common bile duct had been opened and where vomiting had followed, duodenal contents had come out through the fistula by route of the common duct. In one case the dilatation of the common duct and ampulla of Vater was so wide that the finger could pass into the duodenum, so that it was not surprising that the duodenal contents passed back into the fistula. The prompt treatment was by turning the patient on his side, passing the stomach tube, and raising the foot of the bed.

AT a meeting of the Royal Statistical Society on December 19th Mr. T. T. S. de Jastrzebski read a paper on "Changes in the birth rate and in legitimate fertility in London boroughs, 1911 and 1921." In the administrative county of London in the nine months following the census of 1921 there was a fall of 9.4 per cent. from the same period of 1911, although the proportion of married women under 45 years of age in the population should have given an increase of 1.7 per cent. The decline in infant mortality, however, reduced the fall in the effective birth rate—that is, the rate obtained by deducting the deaths under 1 year of age from the births—to 4.2 per cent. Legitimate fertility showed a decline of 12.8 per cent., or when standardized for variation in the ages of the married women under 45, of 11.7 per cent. The gap between the boroughs with better economic conditions and those with a poorer population had diminished sensibly. The natural increase by excess of births over deaths in 1921 was 390,335 as against 354,328 in 1911, and this gain was at the first period of life. There was no reason to consider an infant mortality of between 50 and 60 per 1,000 births as beyond the scope of legitimate expectation. The general conclusions were that the reproductive forces at work in the nation are greater than the destructive, and that the problem of the immediate future is one of over- rather than of under-population.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

INFECTION BY BACILLUS PYOCYANEUS SIMULATING LEPROSY.

A MAN aged 35 had been suffering from perforating ulcers of the foot for a year before he came to me. He then had two perforating ulcers on the right foot—one on the heel about one and a half inches in depth, and the other on the second toe about half an inch in depth. He had also white discoloured patches over the left cheek, on the outer surface of the left arm, on the outer side of the left leg, and on the dorsal surface of the left foot. These patches were not anaesthetic. Besides these he suffered from burning and tingling sensation in both feet. These symptoms resembled those of leprosy, and in fact he was treated for this disease, before I saw him, with sodium gynocardate and sodium morrhuate, without much benefit. He had no nodules on the face, and the ears were not thickened. The ulnar nerve on the left side, however, seemed somewhat thickened. On examining the scrapings from the ulcer I was not able to find lepra bacilli, but I found a large number of slender bacilli with rounded ends, which on cultivation proved to be *B. pyocyaneus*. I prepared an autovaccine of *B. pyocyaneus* containing 100 millions of organisms in each cubic centimetre. This was given subcutaneously every week. The ulcers completely healed after eight injections. The discoloured patches were due to *Microsporon furfur*, and they cleared completely when treated with sodium hyposulphite. The burning and tingling sensation of the feet also disappeared under vaccine treatment, and the left ulnar nerve seems normal.

Hyderabad, Deccan, India. S. MALLANNAH, M.D.

HEREDITARY DEFORMITIES.

ON December 4th I attended Mrs. W., who was delivered of a premature female child with a marked deformity of the left forearm and hand. The radius and ulna were shortened and the hand was inverted and at right angles to the forearm. The family history is as follows:

1. The woman had eight brothers, all born with talipes of the feet; six died in infancy; the two survivors grew up and had several operations performed.
2. A sister had a child with both arms deformed.
3. A cousin on her father's side had a child born with talipes and cleft palate and absence of the rectum necessitating colotomy.
4. On the other hand, the paternal grandmother had eighteen and the maternal grandmother sixteen normal children.

Wivenhoe, Essex. G. TRAVERS KEVERN, M.R.C.S., L.R.C.P.

VAGINA INFRA SEPTA, SUPRA SIMPLEX.

ON November 2nd I attended an East Indian woman at her fourth miscarriage. An East Indian woman friend had been called in to assist, and she felt unable to deliver the foetus. On examination I found a foetus of about 3½ months lying between the thighs and still attached to the cord. By its side was a mass like a blanched after-birth, also attached to what appeared to be a cord. What seemed strange was that the centre portion of the cord remained in the vagina into which the two parts disappeared. To my surprise, on pulling the foetus the placenta was drawn up to the vulva; and on pulling on the placenta the foetus approached the vulva. This was somewhat unusual. Passing two fingers into the vagina, I felt the cervix and the os, which appeared to be single. I could feel nothing to explain what had occurred. But by tracing the cord with the finger in the vagina it was found to disappear. By pressing firmly with the bent finger against the vaginal wall, I at length found the finger was hooked over a partition, and finally it reappeared at the vulvar orifice. It was evidently a case of partially septate vagina—infra septa, supra simplex.

What led to the discovery of the malformation was the accident of the foetus passing on one side of the septum, and the placenta on the other, each appearing by a separate vulvar orifice. This was proved by severing the cord. A fortnight later I made a more careful examination. The two vaginal openings were distinct and equal in size. Two fingers introduced into the vagina—one through each opening—met above the septum, which reached to about two-thirds the length of the index finger. I could discover no other abnormality.

Port of Spain, Trinidad, B.W.I. STEPHEN M. LAWRENCE.

Reports of Societies.

MYOCARDIAL DISEASE.

A PATHOLOGICAL meeting of the Liverpool Medical Institution was held on December 7th, with the President, Professor J. HILL ABRAM, in the chair, when there was a large attendance of members and associates. A number of interesting pathological specimens were shown, and a short discussion followed.

Dr. JOHN HAY then read a paper on myocardial disease as observed in five hearts, in each of which there were present abnormal electrocardiograms indicating inco-ordination in the manner of ventricular systole. Microscopical examination revealed some degree of pathological change in and around the junctional tissues in all except one, which was a case of Stokes-Adams disease; no explanation was offered to account for the complete block or the periods of ventricular stoppage, and this block was not modified by a hypodermic injection of atropine. After investigating these cases and considering the literature it might be said that it did not appear possible to estimate from an electrocardiogram the degree of the pathological change; but an abnormal electrocardiogram of the nature described justified the assumption of some myocardial damage. As a matter of clinical experience there appeared to be little doubt that electrocardiograms conforming to this type materially added to the gravity of the prognosis.

CASES.

Case 1.—Female aged 20; rheumatic myocarditis; mitral stenosis. Clinically there was a moderate degree of heart-block, made complete by digitalis, relieved by atropine.

Case 2.—Male aged 68; Stokes-Adams disease causing death. Clinically there was complete block.

Case 3.—Male aged 55; angina pectoris. Electrocardiograph indicated right bundle lesion.

Case 4.—Male aged 55; auricular fibrillation; chronic renal; adherent pericardium. The electrocardiograph was bizarre.

Case 5.—Male aged 47; syphilitic myocarditis with varying degree of heart-block. Electrocardiograph indicated involvement of the bundle.

Dr. PHŒBE INCE, describing her technique in the foregoing cases, said that a block of tissue was cut from the heart to contain the auriculo-ventricular node, the main bundle, and the upper part of the right and left branches. Serial sections were cut, one block being cut in the horizontal and the other four in the longitudinal plane. The sections were stained by van Gieson's stain, a few in each case being also stained by Verhoeff's elastic tissue stain. Disease of the arteries was demonstrated in Case 4. In Case 3, although there was marked atheroma of the coronary arteries, the artery to the node was unaffected. In the case of syphilitic myocarditis the arteries were apparently unaffected. In the rheumatic heart, Case 1, the main bundle had become involved through the extension of the inflammatory reaction at the base of the tricuspid valve. In Cases 2, 3, and 4 the bundle had suffered in varying degree from chronic fibrosis spreading inwards from the fibrous septum. In Case 5 the damage was most marked in the auriculo-ventricular node, where the nodal elements were almost entirely replaced by vascular tissue. The main bundle showed lymphocytic infiltration and fibrosis, becoming less severe as the bundle was traced to its branches. The left ventricle showed a patchy syphilitic myocarditis.

Professor ERNEST GLYNN spoke of the possibility of lesions occurring in the nervous mechanism of the heart as well as in the myocardium, in such cases.

Dr. I. HARRIS thought that heart-block due to disease of the auriculo-ventricular bundle alone would never give the Stokes-Adams syndrome. As long as the ventricles were normal they would develop a rhythm of their own, which, although at a slower rate, would be quite regular. Asystole for a long period would not take place. In cases where the syndrome appeared the long period of asystole suggested that there was something wrong in the part of the heart below the auriculo-ventricular bundle. Either the ventricle under certain circumstances was unable to develop stimuli of its own or it was unable to respond to stimuli, owing to the fact that its refractory period was longer than normal. It was

therefore possible that the Stokes-Adams syndrome might appear in cases where the auriculo-ventricular bundle was normal. The Q.R.S. complex was usually abnormal in such cases.

THE SCOPE OF DIATHERMY.

A MEETING of the Midland Medical Society was held in the Birmingham Medical Institute on December 6th, with the President, Dr. PURSLOW, in the chair, when about seventy members were present. The evening was devoted to a discussion of the scope of diathermy.

Dr. C. G. TEALL introduced the subject by outlining the physiological principles underlying the method, and gave a brief historical sketch of its development.

Dr. A. E. MILNER of Derby read a paper on the treatment of lupus by diathermy, in which he described in detail the operative procedure necessary, and gave a summary of his results. To illustrate his paper Dr. Milner showed twelve cases treated by this method; considerable periods had elapsed since cessation of treatment. Many of the cases had previously proved resistant to other methods of treatment, and the results were undoubtedly good.

Mr. MUSGRAVE WOODMAN spoke of the value of diathermy in the treatment of malignant diseases of the mouth and throat. He pointed out that although the primary seat of the growth might be totally destroyed by diathermy, it was impossible to deal with the lymphatic glands by this method, and that consequently the method had to be employed in conjunction with surgery. Mr. Woodman also touched on certain dangers connected with the method, and emphasized particularly that of secondary haemorrhage. He was of the opinion, however, that with improved technique these dangers would be considerably reduced. Subsequently Mr. Woodman and Dr. Teall demonstrated the technique of diathermy on pieces of meat.

Dr. E. P. CUMBERBATCH, of St. Bartholomew's Hospital, acknowledged the excellence of Dr. Milner's results, but pointed out that actually they had not been obtained by the use of diathermy properly so called—Dr. Milner's treatment by sparking the patches of lupus was not true diathermy. He then gave a review of the work that had been done lately at St. Bartholomew's Hospital by this method, emphasizing the fact that it had been possible to reduce an inoperable carcinoma to a state which had rendered operation possible.

Mr. B. J. WARD drew attention to the value of diathermy in the treatment of papillomatous tumour of the bladder, and showed several beautiful pictures made at the time of operation.

The PRESIDENT expressed the thanks of the Society to the speakers, and particularly to Dr. Milner and Dr. Cumberbatch, coming from so long a distance. He invited Sir Gilbert Barling to review the communications in the light of his long experience.

Sir GILBERT BARLING said that he was satisfied that diathermy was a method of value in well-chosen cases. He congratulated Dr. Milner on his results, but said that in some of them he thought as good, or even better, results might have been obtained by simple surgical operations. He thought that in the treatment of papillomata of the bladder it undoubtedly constituted a great advance, and also in nose and throat diseases. He believed, however, that wherever it was possible for an operating surgeon to excise a growth complete with its lymphatic drainage diathermy was unnecessary.

SENSORY DISTURBANCES IN RELATION TO DIAGNOSIS.

AT the seven hundred and first meeting of the Brighton and Sussex Medico-Chirurgical Society Dr. E. FARQUHAR BUZZARD gave an address on the subject of "Pain and other sensory disturbances in relation to diagnosis." He emphasized the extreme importance of a correct understanding and interpretation of subjective symptoms and expressed the opinion that without this the early diagnosis of many morbid conditions could not be obtained. Accuracy in obtaining a detailed history from any patient was the chief guide towards determining the nature of a lesion however effectively physical signs pointed to its localization. The difficulties connected with obtaining a satisfactory description of symptoms, such as pain, were very great, and the medical man needed as much patience and skill in cross-examination as did a barrister. He was always handicapped by the lack of education in all classes of patients, who had rarely been taught to think clearly or to be conversant with the use or meaning of the language they spoke. Dr. Buzzard illustrated the importance of accurate descriptions in relation to the various forms of headache, and discussed the possible causes which determined the time and incidence of pain in connexion with the headache due to gross organic disease as well as that due to anxiety states. He pointed out that while the lay mind might be most impressed by the constancy and persistency of headache, the trained medical mind should really pay perhaps more attention to those forms of headache which were transient and paroxysmal. The importance of other sensory disturbances in relation to diagnosis was illustrated especially by reference to the sensory disorders resulting from early patches of disseminated sclerosis, and emphasis was laid on the fact that slight sensory abnormalities unassociated with any disability or gross objective disturbances of function were always of organic origin and not hysterical. Such symptoms were often of great diagnostic importance and might lead to diagnosis of disease when treatment was most likely to be beneficial. In conclusion, the speaker referred to the various sensory symptoms characteristic of early stages of tabes dorsalis, and pointed out how diagnosis of that disease could be made when the lightning pains were present even in the absence of Argyll Robertson pupils and other well-known features of locomotor ataxy.

The PRESIDENT (Mr. A. J. Hutchison) congratulated Dr. Buzzard on his choice of subject and asked him if he could explain intracranial pressure. How was it, for instance, that a tumour the size of a pea could cause intense headache, and how was periodicity of headache to be explained? Mr. ROBERT SANDERSON thought that the lessening of the neurasthenic headache as the day went on was caused, not, as Dr. Buzzard had suggested, by the feeling of relief that the cares of another day were over, but by the strengthening influence of food. Mr. GEORGE MORGAN quoted the late Sir Lauder Brunton's observations of his own trigeminal neuralgia and his theory of an acid wave. Dr. HOBHOUSE spoke of the early morning headache associated with increased arterial tension. In neurasthenics the headache might be greater in the early morning because at that time they had nothing but their symptoms to think of. It was remarkable how often neurasthenics, re-examined after an interval of six months, gave a different localization to their headaches. He had had a patient, aged 47, in whom the pressure of a cerebral tumour had forced open the frontal suture.

Dr. HELEN BOYLE thought it remarkable that very high blood pressure was associated so frequently with absence of headache. In neurasthenics the pressure usually was low, and she thought the lessening of headache during the day was caused by the circulation brisking up, hence the benefit of Weir Mitchell's prescription of early morning black coffee. Dr. GORDON DILL spoke of the type of intense frontal headache, with vomiting, which he attributed to auto-intoxication dependent upon failure of the filtering action of the liver. Dr. A. ORLEBAR asked for information as to the etiology of disseminated sclerosis.

Dr. BUZZARD, in reply, said that he thought Dr. Hobhouse's case most remarkable; it was unique in his experience. Dr. Dill's cases he took to be migraine. In disseminated sclerosis it was practically certain the cause was a spirochaete, and the most likely treatment to be successful was by arsenic on the same lines as in syphilis.

On the motion of Dr. GORDON DILL, seconded by Dr. WALTER BROADBENT, a hearty vote of thanks was accorded to Dr. Buzzard for his interesting address.

GYNAECOLOGICAL EXPERIENCES.

THE Obstetrical Section of the Royal Academy of Medicine in Ireland met on December 1st, with the President, Dr. BETHEL SOLOMONS, in the chair, when Dr. GIBBON FITZGIBBON showed two specimens of adenomyositis of the uterus.

The first was from a woman aged 37, who had had four children, the last one born three years before she consulted Dr. Fitzgibbon. She had been curetted twice, and examination of the curetting showed nothing of note. When she consulted him she complained of constant bleeding, and he took out the uterus to stop this. Except that it was slightly enlarged and soft there was nothing unusual in any part of it. The pathological report he received, however, was that the condition was adenomyositis of the uterus.

The second specimen was from a woman aged 50, who had had haemorrhage for three or four months, lasting from ten days to three weeks. He removed the uterus, and the pathological report was again adenomyositis of the uterus.

The PRESIDENT said that the differential diagnosis of fibrosis and adenomyositis uteri was impossible until the examination of the curettings or of the specimen had been concluded. He felt that the correct and safest treatment for "bleeding uterus" about the menopause was hysterectomy.

Dr. DOMINICK CANNON said that in his opinion treatment by x rays in cases of adenomyositis was useless.

Dr. STEVENSON thought that x-ray treatment had been proved to be of benefit in these cases, and that they were also amenable to treatment by radium; the structure of the uterine mucous membrane could be altered to a greater or less extent by radium.

Dr. ROWLETTE said that the first case resembled what was found in cases of fibrosis uteri, as it showed one very big dilated gland; the history of the case also was similar to cases of fibrosis uteri.

Dr. FITZGIBBON, in reply, said that both the specimens showed a well-defined tumour in the uterus. He had taken out a good many uteri which he would classify as fibrosis uteri, but if examined it would probably be found that a great many of them showed adenomyositis. In his opinion adenomyositis was not cured by radium.

The President, Dr. BETHEL SOLOMONS, showed a uterus with a large cervical myoma.

The patient was aged 35, and first consulted him in 1918 because of sterility. She had been married for eleven years to her husband, whose age was 54. The uterus had been curetted twice by different gynaecologists; a third gynaecologist had curetted and divided the cervix and later had opened the abdomen to dilate the Fallopian tubes. Dr. Solomons, having examined her and found everything normal except a discharging scar from the divided cervix, informed her that he could advise nothing further without examination of the husband; this was refused. In 1920 she consulted him again, and as there was no difference in symptoms or signs, nothing further could be recommended. In October, 1922, irregular menstruation started, with the passage of clots; she felt ill, and examination revealed a fibroid condition of the uterus. At laparotomy total hysterectomy was performed, with removal of one ovary which was cystic. The specimen revealed a fibromyoma springing from the anterior cervical wall; its weight was 15 oz.; microscopically it was a simple fibromyoma with hyaline degeneration. The cervix revealed an unhealed discharging wound from the divided cervix. The specimen called forth several interesting points, and was a comparatively rare specimen. In operating the ureters were isolated, an important and necessary procedure in these cases. The scar in the cervix revealed once more that the operation of posterior division, instead of helping sterility, usually caused it. Dr. Solomons considered that although cases might occasionally become pregnant despite this operation, its malperformance made it a danger in the hands of most operators.

Thereafter Dr. L. CASSIDY read a paper entitled "Recen experiences in Vienna," and Dr. DOMINICK CANNON a paper on treatment of malignant disease by radium.

The PRESIDENT said that there were many questions for discussion in the paper of Dr. Cassidy. Why did the Viennese school give chloroform in eclampsia? In Dublin it had been found disastrous. Why was hysterectomy done in addition to Caesarean section in concealed accidental haemorrhage? Many successful cases had been reported without hysterectomy. He regretted that plugging the vagina was not adopted as the treatment for revealed accidental haemorrhage; probably it had been tried and given up because of ignorance of the exact technique. He was surprised to hear that vaginal hysterectomy was still practised for cancer of the cervix; when in Vienna he had been impressed by the number of occasions when the ureter had been cut during the course of this operation. Interposition was advocated in the treatment of prolapse of the uterus; he believed that nearly all these cases could be cured by careful and thorough plastic work on the vagina. In conclusion, he hoped that the fact that for many years operations in Vienna had been started at 7.30 a.m. would make the people in this country start work earlier; in his opinion, work either in hospitals or in private should not be started later than 8.30 a.m.

Radium, continued Dr. Solomons, had become such a popular method of treatment that the time had come when the status of the radiologist and the gynaecologist must be defined. He believed that the latter should decide when a case required radium treatment, and that the former should carry it out and should send the patient to the gynaecologist from time to time for observation; the gynaecologist should not attempt radium treatment without the assistance of the radiologist.

Dr. ELLA WEBB said that she had taken a course in obstetrics in Vienna, and in her opinion there was no comparison between the teaching of obstetrics in Dublin and in Vienna. Dr. MACFETRIDGE said that he went to Vienna with great expectations, which in a great many respects were not realized. He went to the ophthalmic clinic, and the material there was very disappointing and scanty; on several mornings no operations at all were performed. The nursing there did not seem to him to be as good as it was in Dublin, but in many points they were far ahead, especially in research work and in pathology.

Reviews.

WOMEN IN THE FACTORY.

DAME ADELAIDE M. ANDERSON, late Principal Lady Inspector of Factories, has employed some of her leisure since her retirement in writing a book, *Women in the Factory*.[1] As Viscount Cave says in a brief preface, it tells the story of the women inspectorate from its beginning in 1893 until 1921, and a wonderful story it is of early opposition and obstruction patiently overcome, by conciliation and persuasion where possible, but when necessary by invocation of all the somewhat limited powers of the Factory Acts. In legal contests with persistently defiant employers the women inspectors had to fight their own battles in the courts, without solicitors to represent them, and in opposition to the expert pleaders whom the other side could engage. Nevertheless, the stone of David was often effective against the armour of Goliath, and intimate practical acquaintance with the statutes served frequently to counter the forensic art of the defence. Much better was it, however, when Miss Anderson and her staff could by friendly representation of plain facts bring over the employers to their side, as they often did, and persuade them not merely of the humanity or the decency of the proposals for amelioration, but of the actual profit which would result from reform. The authoress writes with great restraint throughout, even where the rhetoric of indignation might have been excused; but reading between the lines it is easy to understand how keenly she has felt during her quarter of a century's crusade for a better life for women workers. The reader will wonder how the conditions of labour, now in great measure remedied, ever came into existence or were for so long allowed to continue, but it is good to think that the women inspectorate has done so much to enlighten employers and the public and Parliament. The work, of course, is by no means finished.

While Dame Anderson is careful to avoid criticism of the administrative changes of 1921, which largely abolished the differences in the sphere of work of the men and women inspectors, the reader is led to suspect that she doubts or disbelieves in the wisdom of the change. That, however, is a question for experts intimately acquainted with factory work, and "fusion was the line of development chosen by the Home Office." We take it also that the authoress says a good deal less than she thinks when she refers (p. 236) to the Home Office memorandum of 1919 on Substitution of Women, which declared that "there were good prospects for women in this industry," whilst, on the other hand, early in 1920 it was reported that "the steady withdrawal of women from employment in men's industries that began after the armistice was almost completed," so that Miss Anderson herself concluded at the end of the year that there was "as yet no fulfilment of the expectations that after the war a body of industries and operations offering a hopeful field of fresh employment would be open to women where their war experience would be turned to account. On the contrary, an automatically operating force has closed all these expected new avenues."

In the course of the eight chapters which the book contains many other subjects are discussed, such as excessive hours, wages and the Truck Acts, dangerous and injurious trades, accidents and safety, employment of mothers, child labour, labour saving, fatigue, food and efficiency, workers' committees, and welfare management. Every chapter is well worth reading, and the reader will conclude that, whatever philosophers say, life in Dame Adelaide Anderson's case has not been a failure.

[1] *Women in the Factory*. An Administrative Adventure, 1893 to 1921. By Adelaide Mary Anderson, D.B.E., M.A. London: John Murray. 1922. (Cr. 8vo, pp. 316. 7s. 6d. net.)

DISEASES OF THE HEART.

SINCE Dr. John Cowan's *Diseases of the Heart*, with chapters on the electrocardiograph by Dr. W. T. Ritchie, and on the ocular manifestations in arterio-sclerosis by Dr. A. J. Ballantyne, appeared in 1914 and was reviewed in our columns (BRITISH MEDICAL JOURNAL, 1914, i, 1356), opinions have been much tested and in some respects modified by research and by the practical experience furnished by the great war. Accordingly, though nominally a second edition, the volume now put forth by Drs. COWAN and RITCHIE[2]—for the latter now appears as joint author on the title-page—is really a new book, and instead of being dedicated to Dr. Cowan's ancestral tree is inscribed to those roots of knowledge—the Royal Infirmaries of Edinburgh and Glasgow.

The first two chapters give a condensed but clear account of the anatomy and physiology of the heart, and contain useful illustrations of the conduction system. The chapter on morbid changes in the myocardium contains a number of well-executed figures, especially one of infarct and rupture of a musculus papillaris from disease of the coronary arteries. The section on examination of the heart begins with an account of polygraph curves and then describes the electrocardiograph. The next chapter on stimulus production deals with sinus tachycardia, bradycardia, and irregularity, while the chapter on excitability is devoted to extra-systoles of various kinds, which, with the exception of sinus arrhythmia, are the commonest of all forms of cardiac irregularity; thus, to quote the authors, "hardly a day passes but we observe them, whereas auricular fibrillation is seen once or twice a week, auricular flutter once a month, and heart-block once or twice a year." Ventricular extra-systoles, which constitute 70 per cent. of all extra-systoles, are copiously illustrated by electrocardiograms; a ventricular extra systole recurring regularly after each physiological beat is the most frequent form of coupled rhythm or pulsus bigeminus, is a sign of cardiac weakness, and when digitalis or strophanthus has been taken an indication for their cessation or diminution.

Under the heading of conductivity the various forms of heart-block are considered, and it is clearly pointed out that heart-block and the Adams-Stokes syndrome, though frequently associated, are not synonymous, for many cases of complete auriculo-ventricular block without the syndrome are on record, and the syndrome may occur without heart-block. The account of auricular flutter (in the recognition of which Dr. Ritchie played an important part) is clear and gives full attention to the observations of other workers; that it is comparatively rare is shown by the occurrence of only one case among 2,500 soldiers admitted to a heart hospital during two years. The features of auricular fibrillation are well portrayed, attention being drawn to the more favourable prognosis in cases with mitral stenosis as contrasted with those due to other causes and to the ominous significance of extra-systoles. The drawbacks and dangers of quinidine sulphate, such as sweating, diarrhœa, abdominal pain, embolism, and fibrillation of the ventricles, are mentioned, and the conclusion is reached that on the whole this new drug appears to have little therapeutic value.

Under the heading of nodal rhythm are described three groups of cases, all showing synchronous contraction of the auricles and ventricles in response to stimuli arising in the auriculo-ventricular node; in order to avoid any confusion which might be engendered by Sir James Mackenzie's use of the term "nodal rhythm" for what is now known as auricular fibrillation it might be more convenient to speak of this condition as auriculo-ventricular rhythm. These three groups are (1) nodal rhythm without tachycardia, (2) continuous nodal tachycardia, and (3) paroxysmal nodal tachycardia. Many of the cases commonly spoken of as paroxysmal tachycardia belong to the last group, but others are examples of auricular flutter, paroxysmal auricular fibrillation, or of the rare form paroxysmal ventricular tachycardia.

In speaking of the treatment of malignant endocarditis the poor results from vaccine therapy—four cures—are emphasized, and the authors consider that the most important factor is probably a good digestion, whereby the patient's nutrition is maintained in a satisfactory state. After accounts of chronic valvular disease and myocardial failure angina pectoris is described as a symptom arising from many causes, about which if there is anything certain it is its uncertainty as regards its occurrence and significance. In some cases the blood pressure is raised during the attacks, and in these amyl nitrite almost invariably gives instantaneous relief, whereas patients whose blood pressure is not elevated during the attacks are seldom helped by inhalation of this drug. In general the outlook is better in cases with high blood pressure than in those with cardiac weakness, but whatever the cause, the heart or the aorta are always exposed to stress and strain. Bromides given between the attacks are useful in nearly all cases, and particularly in hypersensitive patients who sleep badly. Disordered action of the heart, acute pericarditis, adherent pericardium, pneumopericardium, and congenital heart disease are passed in review, and finally arterial disease and aneurysm are summarized, with the inclusion of Dr. A. J. Ballantyne's description of the ocular manifestations in arterial disease, illustrated by a coloured plate of the fundus in chronic nephritis.

This well-written work is so admirably balanced that it is well fitted for students and practitioners; it gives due prominence both to the well-established principles and to the recent advances of cardiology, criticizes them out of the fullness of long personal experience, and is often refreshing in its diction—for example, in the reference to the case of "a man of forty-seven years, a stone-breaker by occupation and an alcoholic by choice." The authors may be confidently congratulated on their success in providing a handbook that deserves popularity.

[2] *Diseases of the Heart.* By John Cowan, D.Sc., M.D., F.R.F.P.S., and W. T. Ritchie, O.B.E., M.D., F.R.C.P.E. With a chapter on the Ocular Manifestations of Arterial Disease by Arthur J. Ballantyne, M.D., F.R.F.P.S. Second edition. London: Edward Arnold. 1922. (Demy 8vo, pp. xvi + 625; 321 figures, 3 coloured plates, 3 folding plates. 30s.)

A FRENCH TEXTBOOK OF THE EAR, NOSE, AND THROAT.

IT is just over two years since a review of the first edition in English of Dr. GEORGES LAURENS'S *Oto-Rhino-Laryngology*[3] was published in this JOURNAL. The appearance of a second edition after so short an interval is sufficient evidence of the favourable reception accorded to the work in this country. It is significant, too, that the present volume is a translation of the fourth French edition, and that the book has also been translated into Spanish. The general style and purpose of the book remain unchanged; neither is there any alteration nor addition of outstanding importance to note in matters of detail; but it is satisfactory to observe that the translation has been improved and some mistranslations of French idioms have been remedied. The text has been brought well up to date. As before, descriptions of the great operations are properly regarded as beyond the scope of the work, but the minuteness of detail and the wealth of illustrations should prove of great value to the practitioner in the examination and management of patients. It is, however, right to repeat that the teaching is by no means a mirror of the practice of otology and laryngology in this country. The descriptions of the methods of removing tonsils and of treating malignant disease are examples of this difference, of which other instances are frequent. The book is, on the other hand, an accurate and detailed exposition of the methods generally accepted and practised in France. With this reservation the second edition may be commended as heartily as was the first to all interested in the subject.

[3] *Oto-Rhino-Laryngology for the Student and Practitioner.* By Dr. Georges Laurens. Authorized English translation by H. Clayton Fox, F.R.C.S.Irel. Second English edition. Bristol: John Wright and Sons, Ltd.; London: Simpkin, Marshall, Hamilton, Kent, and Co., Ltd. 1922. (Demy 8vo, pp. xii + 350; 539 figures. 17s. 6d. net.)

SOCIOLOGY AND PSYCHOLOGY.

WE take two books, Mr. ROPER'S *The Individual and the Community*[4] and Dr. ARTHUR LYNCH'S *Ethics*,[5] together because both the authors aim at establishing new principles in human conduct, and both seek a basis for speculations which are not scientific or scientific fact. Both Dr. Lynch and Mr. Roper may be credited with the desire to improve human conditions; and though the results of their speculations may differ little from the Utopias of the past, they may be useful in stimulating thought.

Mr. Roper is one of those who speak with contempt of all present and past statesmanship as "old men's games," modelled on the ruins of past empires. He says quite truly—or platitudinously—that the laws which govern human nature may be found in the daily lives of men, women, and children; he then builds up a system for which the only suitable name would seem to be individualistic communism—

[4] *The Individual and the Community.* By R. E. Roper, M.A., M.Ed. London: George Allen and Unwin, Ltd. (Demy 8vo, pp. 224. 8s. 6d. net.)

[5] *Ethics: An Exposition of Principles.* By Arthur Lynch. London, New York, Toronto, and Melbourne: Cassell and Co., Ltd. 1922. (Post 8vo, pp. xii + 323. 7s. 6d. net.)

a contradiction in terms. Community of effort, he says, does not depend upon authority, but on natural control evolved by daily life, such as common sense, sympathy, tact, self-reliance, creative work, voluntary association, and the like. Therefore Mr. Roper objects to discipline and punishment, and regards the gospel of duty as a means devised by the wicked rich for holding the poor in control. According to this view, an obedient democracy is provided for the maintenance of the present form of community by those who mishandle our destinies under the pretence of statesmanship. The whole of this argument is somehow based on "Brownian movement." Thus, Mr. Roper says that the whole solar system is permeated by vibrations. Vibration and movement are characteristic of the material in which man's physical nature is manifested. In order to receive and to generate vibrations man must evolve within himself an internal harmony between his own vibrations. Internal harmony and self-control are identical in their nature, and the attempt to substitute external authority for either is in the end disastrous. In this way does Mr. Roper misuse the scientific observation of Brownian movement for his own ends, and for the enunciation of such excellent exclamations as "We need a community where none go hungry and none are slaves." It is not surprising that the Master of Peterhouse, in a letter about Mr. Roper's book, quoted in the preface, seems to display some effort in being complimentary.

Dr. Lynch set forth "to see the drift of things in an ethical sense, to throw a beam of light upon the sources and the goal of our acts." He found very little guidance in the work of thinkers who had gone before. None of the systems of ethics appeared to him to rest on a deep base, rising by reasonings, cogent and consecutive, to the conclusions it expressed; so that some systems, and those not the least authoritative, seemed to dwindle into sheer absurdity. Dr. Lynch examines the philosophies of many writers, including Aristotle, Kant, and Herbert Spencer. He rejects them all as unsatisfying, though he has some good words to say for Aristotle. He states the central problem as follows:

> "Standing in the universe, regarding all its phenomena and in face of all the world of thought, to endeavour to find by the force of reason alone, if not the goal or purpose of our lives, at least great cardinal lines of guidance towards higher development, and to exhibit these as derived from a fundamental base by clear and consecutive arguments."

No doubt Dr. Lynch is right in saying that in order to form correct notions of man's place in the cosmos it is necessary to gain some true conception of the cosmos itself. Consequently the study of ethics demands the subsidiary study of the physical, biological, and mental sciences. He set himself to find in the conditions of nature the sanctions of an ethical system; he considers that he has discovered these sanctions, and that his system of ethics has "reality of life." His fundamental principles are truth, energy, and sympathy. The principle of truth becomes extended into the development of science; the principle of energy gives rise to the standard of efficiency; the principle of sympathy implicates that of co-operation, and at length that of justice. So far these principles do not seem to differ much from the principles of many ancient systems. But having started with science Dr. Lynch proceeds to deal with the problem of the immortality of the soul, which he says is vital to ethics. The arguments of the religious, those of Plato, of Paul, of Berkeley and others of the idealist school, are all faulty, says Dr. Lynch, and it is possible to show that science is not inconsistent with the doctrine of immortality. "The verdict is for the immortality of the soul." "Over all our lives looms a great purpose"; but we cannot find any very definite statement as to what that purpose is. The fourth and last part of Dr. Lynch's book deals with his notion of government; the elimination of war; the definition of some favourite ethical qualities in a pleasantly cynical manner; the statement that the motive force in ethics is not pleasure but the "natural satisfaction of needs that correspond to development."

Dr. Lynch's "purpose" is far too intangible. The impartial observer might come to the conclusion that in the present state of our knowledge the Christian system of ethics may possibly be more satisfying than the hazy system of Dr. Lynch. If Dr. Lynch desires to investigate scientifically human conduct he would probably find that the best method would be to begin with the individual and find out in a detached manner exactly what his motives are or have been. Thence he could proceed to the ethics of communities, and so to generalizations, which must still be tested against the solid fact of the individual.

NOTES ON BOOKS.

AMONG the books which are really difficult to write are those on medicine for non-medical persons. It is an everyday experience to discover how dangerously little the ordinary patient understands of the instructions given him or her about the prescription or bottle handed over as part of the treatment. The writers of most books on domestic medicine are wise in counselling resort to the medical man. Missionaries, however, are in a specially difficult position: they may be far from professional assistance or within reach only of the nostrums of native quacks; at all events they are going to live in places very different from the home countries and with risks of novel illnesses and unsuspected morbid causes in alarming numbers. The Association of Medical Officers of Missionary Societies, London, is, therefore, rendering a useful service in sending out a third edition of *Health Instructions for Missionaries in the Tropics*.[6] Good advice is given on prevention of illness (with special reference to mosquitos, flies, and food) and regarding dress and habits (exercise, bathing, sleep, and alcohol). There is a section, too, on the emergency treatment of malaria, blackwater fever, dysentery, and cholera by Dr. Basil Price and Sir Leonard Rogers, which may save lives and probably has already done so. It is, perhaps, rather a high compliment to the intelligence of the ordinary missionary that he should be advised to make blood films before he administers quinine in malaria, but one remembers how in some parts of the world (as in Central Africa) the missionary must be, as Horace calls him, *centum puer artium*, or, as we say, jack of all trades.

It is proposed to issue a series of psychological reprints and translations with Professor KNIGHT DUNLAP of Johns Hopkins University as editor. The first volume of these "Psychology Classics" has been published under the heading of *The Emotions*.[7] It contains a new translation of Lange's *Ueber Gemütsbewegungen*, made by Miss Istar A. Haupt from Kurellà's German version; together with a reprint of James's *What is an Emotion?* and his chapter on "The Emotions" from the *Principles of Psychology*. The James-Lange theory has exerted a profound influence upon the development of psychology, and in making these contributions readily accessible to students of psychology, philosophy, and physiology a real need has been met. Further volumes will be awaited with interest.

The new number of *Brain*,[8] which is now edited by Dr. GORDON HOLMES, contains a series of papers mostly of a special character. The first is an article by Dr. J. Babinski on "Réflexes de défense"; Drs. Bazett and Penfold follow with a study of the Sherrington decerebrate animal. There is a paper by Drs. A. F. Hurst and J. R. Bell on the pathogenesis of subacute combined degeneration of the spinal cord, and another by Professor Harvey Cushing on the meningiomas.

The handy little pocket commentary entitled *Common Errors in First Aid*,[9] in which Dr. N. CORBET FLETCHER indicates various mistakes frequently made by ambulance students, should be read in conjunction with one of the recognized manuals, as where the official instructions leave any loophole for doing a thing the wrong way Dr. Corbet Fletcher clearly points out the correct procedure and the reasons for it. The author's long experience as teacher and examiner has given him an unrivalled opportunity of discovering where first aiders may go wrong, and readers of this little book should reap the benefit of this wide knowledge.

We own to a feeling of admiration for any medical man who undertakes the writing of a full length novel and brings his self-imposed task to a successful conclusion. Dr. HERBERT HARRISON has occupied his leisure in this way, and the result is *The Braganza Necklace*,[10] described in the subtitle as "an account of the strange adventures in the early life of Sir John Swayne, M.D., physician to the Court of His Majesty King George the Third." This kind of romantic tale is beyond the sphere of our criticism; but Christmas books are now in season and we wish Dr. Harrison's volume, with its wealth of stirring incident, all the prosperity it deserves.

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[6] *Health Instructions for Missionaries in the Tropics.* Edited and published by the Association of Medical Officers of Missionary Societies, 1, Farnley Road, London, E.4. 1923. (Cr. 8vo, pp. 16. For further particulars application should be made to the Honorary Secretary.)

[7] *The Emotions.* Volume I of Psychology Classics. By Carl Georg Lange and William James. Baltimore: Williams and Wilkins Company. 1922. (Med. 8vo, pp. 135. 4 dollars for foreign countries.)

[8] Vol. xlv, Part II. London: Macmillan and Co.; New York: The Macmillan Company. (Price per part, 6s. net; yearly subscription, 24s. net.)

[9] *Common Errors in First Aid.* By N. Corbet Fletcher, M.B., B.Ch., M.R.C.S., L.R.C.P. London: John Bale, Sons and Danielsson, Ltd. 1922. (Demy 16mo, pp. 72. 1s. net.)

[10] *The Braganza Necklace.* By Dr. Herbert Harrison. London: Sampson Low, Marston and Co., Ltd. 1922. (Cr. 8vo, pp. 280. 6s. net.)

THE PLIGHT OF THE RUSSIAN DOCTORS.

A Christmas Appeal to the British Medical Profession.

IN June last the Council of the British Medical Association made an appeal for the starving doctors of Russia. In order that the response should be as widespread as possible the subscription was limited to 5s. Within the next few weeks the sum of £1,610 was received and was paid over to the American Relief Administration, which promptly dispatched food parcels to those doctors and members of deceased doctors' families whose names had been supplied by an organization of Russian doctors in this country. The Association has had a signed receipt from Russia for every parcel delivered.

Since the appeal many letters have been received from individual doctors and from bodies of doctors in Russia, testifying in the most touching way the gratitude of the recipients of the food parcels, not only for the gift but for the evidence that the doctors in Russia had not been forgotten by their more fortunate colleagues in other parts of the world.

A typical individual letter is one recently received from a woman doctor in Russia who is working at a clinic for mental diseases. She gives full particulars about herself and her professional status and goes on to say:

"My family, which lives solely on my earnings, consists of my aged mother of 70, two brothers (both war invalids from 1914–15: one, 45 years old, was wounded in arm and leg and is almost totally disabled; the other, 47 years old, was wounded in the head and is mentally deranged), and a sister who recently underwent a serious operation—half her stomach was removed. I ask you to help these four persons who are unable to do any work, be it only by sending them *one* food parcel."

The following acknowledgement from Petrograd is typical of many received from collective medical bodies:

"The section of the American Relief Administration in Petrograd has in the name of the British Medical Association transmitted to the Academy of Medicine for the professors and assistants 44 boxes containing in all 132 poods of different nutritive substances. The professors and assistants of the Academy of Medicine are glad to see in that gift a token of the unity of the whole scientific world and wish to express their deep gratitude to the representatives of the British Medical Association." (This was signed by the vice-president of the Academy and eleven other representatives.)

It is only too clear that what has been done is a mere scratching of the surface, below which is a dreadful mass of want and misery. The situation is perhaps best described in the words of Mr. W. E. Haigh, F.R.C.S., a British doctor who is attached to the Nansen High Commission. In a letter addressed to the Association, dated "Moscow, September 24th," in which he expressed his satisfaction with what the Association had already done, he went on to say:

"The position of our colleagues becomes steadily worse. . . . The depreciation of the rouble and soaring prices make it impossible for them to provide food for their families, even were such obtainable in plenty. The salaries paid are fantastic, being much less than those of workers; for example, I pay my chauffeur one hundred millions a month and food packets; doctors working in the cholera blocks of the Odessa City hospitals receive 27 millions and, happily, have gifts of maize from the American Relief Administration, but pay is always in arrears. There are doctors in the country who have had no pay this year, and depend on small gifts from the peasants, but this in famine-stricken areas cannot be much. The doctors in Cherson on the Black Sea have had no pay for six months, and their lot is desperate. That city, once of 80,000 inhabitants, passed through all the horrors of famine last winter, combined with epidemics of typhus and relapsing fever, followed by a severe epidemic of cholera in the summer. Hospitals, unheated, without soap, appliances, drugs, provided with a ration for all of 600 calories a day, often mixed with surrogates, conditions have been such as require the pen of Dante to describe. . . . The sole means of keeping doctors and nurses alive was the American maize. . . . I know those (doctors) who have had their children at home with oedema, living on surrogates, those who have eaten linseed cattle cake instead of bread, or the pressed mass after the extraction of oil from sunflower seeds; some have died on duty, and typhus has taken fresh toll, and for their wives and children there is nothing. The best off financially are poor and their means are often the sale of books, silver, the furs, clothing, and jewellery of their wives, and these reserves are now exhausted. . . . Surgeons of repute may have no stockings, medical women no fires in their room in winter, yet they will entertain one if they can, and it is pathetic to see their enthusiasm to talk 'shop' . . . and their joy at having a colleague from abroad even for half a day. The needs of the professors are great . . . but the rankers are in worse straits, and I wish to point out that all forms of help can now be administered best through the local medical societies; if we find the food they know the needs best. . . . Wood for firing costs to-day in Odessa 40,000 roubles a pound, petroleum is 8 millions a pood, butter 1,800,000 a pound, and with such a market the doctor's wife has to sell necessary clothes, not to buy."

Dr. Haigh's evidence is borne out by many pathetic letters the Association has received, and the Council at its meeting on December 13th resolved to make a Christmas appeal to the medical profession in this country to do something more to alleviate the terrible conditions in which our colleagues in Russia, through no fault of theirs, are living—and dying.

The results of the present appeal will be divided between the American Relief Administration and the All-British Appeal of the Nansen High Commission. There is plenty of room for both bodies, and each in its own way can be depended upon to see that money subscribed by the British medical profession is spent in providing the necessities of life to Russian doctors and their families.

Clothing is almost as badly needed as food. The American Relief Administration in its latest report (December, 1922) says: "While the need of foodstuffs in Russia continues a grave problem, the needs of the population for warm clothing are equally grave." The American Relief Administration has entered into an agreement with the Soviet Government to allow clothing remittances to be made for individuals. This arrangement will be utilized to send clothing where we are advised that clothing is more urgently needed than food.

Subscriptions of *5s., or multiples of 5s.*, should be made payable to the Russian Doctors Relief Fund and sent to Mr. L. Ferris Scott, the Financial Secretary of the Association, 429, Strand, London, W.C.2, who will acknowledge their receipt. The amount collected will be acknowledged week by week in the BRITISH MEDICAL JOURNAL, but not the names of individual subscribers.

We ask each of our readers who is looking forward to a happy Christmas to send something to help to keep alive medical men and women in Russia, who are striving to carry on their work under almost impossible conditions and in a spirit of devotion and self-sacrifice which is an inspiration to the profession the world over.

WILLIAM MACEWEN,
President.
R. WALLACE HENRY,
Chairman of Representative Body.
R. A. BOLAM,
Chairman of Council.
G. E. HASLIP,
Treasurer.

NOTES ON SMALL-POX.

BY
W. McCONNEL WANKLYN, B.A.CANTAB.,
M.R.C.S., L.R.C.P., D.P.H.

Differential Diagnosis between Small-pox and Chicken-pox.

THERE is no royal road to certainty in this subject, nor any rule of thumb upon which exclusive reliance can be placed; it is no more possible to recognize every case of chicken-pox by rule than that of any other disorder, the pathological manifestations in any given case being the result of the combination and reaction of various types of disease, skin, age, and occupation in varying degree and proportion. Experience must necessarily play a large part in the formation of an accurate diagnosis of the more difficult cases. Nevertheless, it is possible, and very material, for less expert observers to select, cultivate, and stress those points upon which sound experience may gradually be built up; to assist in that is the main purpose of this article.

In order to produce a clear impression at the beginning, a certain class of case which well illustrates certain leading features will be discussed. Allusion is made to those adult cases—often at first sight appearing formidable, though in reality they are not so—in which the diagnosis certainly rests between small-pox and chicken-pox. Long experience shows that in a majority—not all—of these cases their true nature can be demonstrated by the simple means of an actual count of parts of the rash. It is better known now than it used to be how in such cases the rash is frankly centripetal—that is, how it shuns the distal parts of the extremities and accumulates on their central parts and on the trunk; but it is not so well known how frequently this can be demon-

strated by a precise count; and this simple and most helpful factor it has long been my object to lay before my colleagues for their comfort and convenience. It is submitted that these facts should be known to every member of the profession, as no doubt in due course they will be, and included in all the medical textbooks.

An example or two will clear my meaning; the following have been taken at random from notes of some five hundred cases of varicella in which there was difficulty in differentiation from variola.

VARICELLA: COUNT OF SPOTS.

Case A.				
Right hand	4	Left hand	4	
Right forearm ...	28	Left forearm ...	20	
Right arm	97	Left arm	84	
Face			(about) 130	
Front of trunk			(about) 350	
Case B.				
Right hand	0	Left hand	0	
Right forearm ...	2	Left forearm ...	2	
Right arm	11	Left arm	6	
Face			59	
Front of trunk			23	
Case C.				
Right hand	0	Left hand	2	
Right forearm ...	7	Left forearm ...	6	
Right arm	13	Left arm	16	
Face			54	
Front of trunk			49	

In the above the face means the mask of the face; and the front of the trunk is that space included between the lines of the clavicles and umbilicus and the anterior axillary lines. Such a count can usually be made in about five minutes; and not infrequently the patient or friends will check it.

It will be seen that the *relative* distribution is the same in each case; and in the majority of cases denotes the correct diagnosis to a certainty. Forty or fifty more such cases could be quoted did space permit.

When this relative distribution of the spots has been thus established, it is necessary to confirm or refute the evidence thus offered; for this purpose it is wise to refer to some tender and protected area of the skin, typically the flank, arm-pit, or chest. For this purpose the extremities should be avoided, and especially the face, a site on which the rash is more difficult to distinguish from that of variola than elsewhere.

In the flank or similar region will be found the most typical lesions of varicella; and there may be noted their superficial character, as estimated by rolling the lesions between the finger and thumb, the fact that the long axis lies parallel to the natural folds of the skin, the wrinkled outline and flaccid nature of the lesion.

When these two main features have been established—namely, the distribution and the character of the individual lesions—reference should be made to the condition of the patient just before the rash came out, great care being taken to arrive at the real facts. In one case lately the patient was able to show that she had attended a Girl Guides' function just as a copious rash was appearing; and in another the correct diagnosis was made for me by two bream which were swimming in a basin in the patient's scullery and had been caught by the patient during the stage of invasion of the illness; variola seldom permits of such diversions in the stage of invasion; varicella seldom forbids them.

If by this time the diagnosis still remains in doubt and there is no further opinion to consult, the development of the rash should be watched and noted from day to day; that usually is widely different in the two diseases, and as a rule points clearly to the true nature of the case.

Two more points perhaps once again may be mentioned. The best possible light must be insisted on; and the patient should be uncovered to the waist save for a shawl or other appropriate wrap.

These hints are the result of many years' experience, and have been found to be of the highest practical value. The method combines reliability with saving of time. For these reasons it is now offered to my colleagues as being, in this class of case, the most useful they can have.

Additional illustrative cases are as follow:

Case D: Chicken-pox.				
Right hand	0	Left hand	0	
Right forearm ...	16	Left forearm ...	30	
Right arm	46	Left arm	48	
Face			106	
Front of trunk			108	
Case E: Chicken-pox.				
Right hand	0	Left hand	1	
Right forearm ...	6	Left forearm ...	8	
Right arm	15	Left arm	14	
Face			20	
Front of trunk			30	
Case F: Chicken-pox.				
Right hand	2	Left hand	1	
Right forearm ...	17	Left forearm ...	14	
Right arm	34	Left arm	15	
Face			40	
Front of trunk			35	
Case G: Small-pox.				
Right hand	42	Left hand	48	
Right forearm ...	30	Left forearm ...	20	
Right arm	25	Left arm	22	
Face...			150	
Front of trunk			7	

I should be glad of any similar notes of cases to add to my collection.

INTERNATIONAL HYGIENE.

WE have received from the Director of the Office International d'Hygiène Publique a summary of the proceedings of the last session of that Office in Paris, which has been prepared and circulated to delegates with the object of its publication in the medical or technical journals of the different countries. The Office International works in liaison with the Health Committee of the League of Nations. Since it came into existence in 1907 it has published a number of communications in its monthly *Bulletin*, where they appear together with the statements of sanitary laws, conventions, epidemic disease statistics, etc., which form the staple material of that publication. This is the first time, however, that it has made any public communication of the proceedings of a session.

This year's session of the Permanent Committee of the Office International d'Hygiène Publique was held from October 23rd to November 1st, under the presidency of M. Velghe (Belgium). The British delegate was Sir George Buchanan, and the other countries represented were: Chili, France, Norway, United States, Roumania, Switzerland, Poland, French West Africa, French Indo-China, Egypt, Persia, Netherlands, Portugal, Italy, Tunis, Australia, Morocco, British India, Kingdom of Serbs, Croats, and Slovenes, Algeria, Monaco, Union of South Africa, and Madagascar.

Revision of the International Sanitary Convention of Paris, 1912.

The Committee concluded its examination of the revised draft of the International Sanitary Convention of Paris of 1912. At its preceding sessions the Committee had already agreed upon its proposals regarding Chapter I of the Convention, which contains all the regulations concerning the measures required for prophylaxis of plague, cholera, and yellow fever. At the present session Chapters II and III came under consideration. These chapters (II, Special Provisions for Countries in the East and Far East, and III, Special Provisions for Pilgrimages) bear on the carrying out in Egypt of the regulations laid down in Chapter I, the sanitary regulations for shipping in the Near East, Red Sea, and the Persian Gulf, and the supervision of the pilgrimage to Mecca. It was not proposed that Chapters IV (Supervision and Practical Application) and V (Adhesions and Ratifications) should be subjected to any revision. In connexion with Chapters II and III it is pointed out that at the beginning of 1922 the Health Committee of the League of Nations sent a mission to study on the spot the organization of measures against epidemic disease in the Near East. This mission, in collaboration with the Sanitary Maritime and Quarantine Board of Egypt, prepared a scheme which was taken as the basis for the work of the Committee of the Office. The revised text of Chapters II and III will be transmitted to the French Government, as has already been done in the case of the revised text of Chapter I, in order that it may be communicated to the various Governments concerned with a view to the assembly of the next International Sanitary Conference, at which these proposals will be decided upon.

International Nomenclature of Diseases.

The nomenclature of diseases, as defined by an International Conference in 1900 for use in the compilation of nosological statistics, was revised in 1909, and in 1920, on the initiative of the League of Red Cross Societies, the French Government convened another International Conference with a view to a further revision. The international nomenclature, as laid

down in the Conference of 1920, was circulated to the members of the Committee in the course of the session. The delegates were satisfied that most of the defects in the 1909 list had been corrected, and agreed to recommend the adoption of the 1920 nomenclature to their respective Governments. In this connexion, however, a special difficulty had arisen. M. Bertillon, the devoted secretary and moving spirit of the various conferences, died while the publication of the proceedings of the Conference of 1920 were still in preparation, and some delay and confusion was thus caused. Several members of the Committee who had also been members of the Conference represented that the text submitted did not always reproduce exactly the decision actually reached by the Conference. Negotiations are now in progress for the correction of these errors.

Therapeutic Serums and Derivatives of Arsenobenzol.

The Committee had on its agenda two questions, one concerning the derivatives of arsenobenzol—their toxic effects, the regulations governing the manufacture and importation of these products in different countries, and the possibility of their eventual international regulation; the other, therapeutic serums—the regulations governing their production and sale in different countries and the possibility of standardizing them internationally. In connexion with the first point, the Office had obtained a considerable amount of material, partly by answers to questionnaires addressed to the members of the Committee, and partly by its own investigations. The subject appears to be very complicated, and, in certain respects, incompletely elucidated. The unanimous opinion was that it would be better not to draw any immediate conclusions but to carry on the investigations already in hand. A report will be prepared to be discussed at the spring session, 1923.

With regard to the laws and regulations of different countries regarding therapeutic serums the inquiry has so far been limited to antidiphtheritic serum, on which a special report prepared by the permanent staff of the Office was presented to the Committee. This report was revised and completed as a result of suggestions by the different delegates, and in this form has been published in the November number of the *Bulletin* of the Office International. Certain conclusions of the report, particularly in regard to the preparation of a draft international regulation for the strength of diphtheria antitoxin, have still to be considered. The Committee decided not to undertake this at the moment in view of information which is now being obtained from the conferences on standards for therapeutic serums which are being held under the authority of the Health Committee of the League of Nations. One of these conferences has since taken place in Paris, and, at the invitation of the Health Committee of the League, the Office International d'Hygiène Publique was there represented.

Bills of Health and Sanitary Log Book of Ships.

During its preceding session the Committee had studied a series of questions concerning bills of health and the institution of a sanitary log book on ships. The report before us contains a closely reasoned summary by the President of the chief aspects of these complicated questions; in the course of this he stated that the staff of the office had collected a considerable amount of information concerning the form of bills of health actually in use and, as instructed, had prepared two schemes. The Committee reserved for further consideration these schemes drawn up by the Office, together with two others suggested by the sanitary administrations of Italy and Algeria. All these will be printed and circulated and a decision will be arrived at during the spring session of 1923.

Another matter discussed was the signals by means of which ships may make known, on arrival, the sanitary condition on board. The International Code of Signals in force since 1901 comprises a certain number of conventional signs (the yellow flag, representing the letter Q, and others) relating to the sanitary condition of ships. The Committee considered that it would be well to have a wider range of signals than those represented by the two letters Q and L. The signals required should be simple; they would enable the ship to give the sanitary authority certain information concerning the conditions this authority would find on board and would thus, by avoiding comings and goings, make the duties of this authority easier of execution. The following resolution was therefore passed:

The Committee of the Office International d'Hygiène Publique recommends that maritime powers should consider as soon as possible whether it would be desirable to complete the International Code of Signals by the introduction of special signals in the form of a flag by day and by lights at night to show:

(1) That the ship is free from all diseases and asks for free pratique, or

(2) That the ship is suspect—that is to say, that cases of infectious diseases or suspected cases of these diseases have occurred on board more than five days previously or that an unusual mortality among rats has occurred, or

(3) That the ship is infected—that is to say, that cases of infectious diseases or suspected cases of these diseases have occurred within less than five days.

The Committee also draws the attention of maritime powers, which have accepted the International Code of Signals and issue regulations for flags and lights which apply to ships entering their territorial waters, to the importance of securing that particular signals used for the suggested sanitary code are not utilized for any other purpose.

Measures against Abuse of Narcotics and Alcohol.

The Italian delegate communicated the draft of Italian legislation dealing with the illegal traffic in narcotics. The delegates from France, Holland, the United States, Denmark, and Tunis gave an account of the legislation in force or about to be introduced in regard to opium, cocaine, etc., in their respective countries. The greater part of the morphine and cocaine consumed in Europe comes from Germany. It was considered that the only way to put a stop to the international smuggling, which takes place in spite of all supervision, would probably be to have strict supervision in factories and to require, for instance, that an official representative should prevent the exportation of any quantity of these drugs to a destination which is not guaranteed. A note from the delegate for India drew attention to the consideration that a moderate use of opium as practised among the natives in India does not necessarily entail danger to the population, and that there is no need for the authorities to take repressive measures in regard to such use. The Polish delegate read a memorandum concerning the favourable effect of the prohibition of alcohol (spirits, etc.) during the war on the number and the development of psychic diseases in Poland. This memorandum will be published in the *Bulletin*. It was stated also that in Belgium mental specialists are agreed that the number of cases in asylums has diminished owing to the new legislation relating to spirituous liquors.

Epidemiological Data.

Communications were received and considered on the following subjects: the sanitary conditions of Poland, the sanitary state of Roumania, small-pox in Switzerland, the measures taken against trachoma in Indo-China, the prevalence of yellow fever on the West Coast of Africa, plague in Madagascar, and international statistics concerning cancer. In regard to plague in Madagascar, attention was drawn to the occurrence of septicaemic cases extremely rapid in their development and sometimes causing death in less than forty-eight hours. In these cases no pulmonary symptoms occurred and the evidence pointed to the transmission of infection from case to case by means of fleas without the intermediary of rats. Cases in which plague appears to have been carried in this way were also brought forward by the delegate for Algeria. This method of plague propagation would appear to be more dangerous, at least under certain conditions of housing and living, than has hitherto usually been admitted.

The Swiss delegate mentioned that in 1921 there were cases of small-pox in the cantons of Bâle and Zurich, where it had for many years been practically unknown, although vaccination is not compulsory in these cantons. The disease manifested itself in two different types: at Bâle the usual serious symptoms were present; elsewhere the disease was entirely benign, and not a single death occurred among many hundreds of cases. In many instances the general feeling of indisposition and discomfort which resulted from small-pox was less than that which resulted from vaccination. This form of the disease nevertheless is clearly only a mild manifestation of the serious type, of which all the characteristics are present, though in an attenuated form. The Swiss sanitary authorities are of opinion that in this second instance the outbreak was definitely an outbreak of modified small-pox. The discussion showed that this benign small-pox is present in other countries under various names—"white-pox" in the United States, "mild small-pox" in England, "milk-pox" in Gaboon.

The British delegate drew attention to the occurrence in August, 1922, of the first cases of botulism, at Loch Maree, which had been reported in Great Britain. A statement by the delegate for British India showed that Colonel W. Glen Liston's apparatus for the clearing of rats from ships by means of hydrocyanic acid gas gave excellent results in Bombay, and that the use of this apparatus, of which a complete description is given in the *Journal of Hygiene* of October, 1922, may possibly be extended to other ports of India.

British Medical Journal.

SATURDAY, DECEMBER 23RD, 1922.

ENVIRONMENT AND DIET IN THE CAUSATION OF RICKETS.

SEVERAL circumstances have recently combined to increase the interest in the vexed question of the etiology of rickets. There have been, in the first place, the striking results of the experiments on the effect of the absence of vitamin A (sometimes called the growth factor) from the diet. In the second place we have the results of what may be called the Glasgow investigations, which point to the importance of bad housing and want of exercise. Thirdly, recent views as to the therapeutic value of calcium salts and phosphates have to be taken into consideration; and, finally, we have the observations—some of them very astonishing—on the effect of light in preventing and curing rickets. The matter has been taken up by the Medical Research Council, which has recently published two reports, the one by Dr. Corry Mann, physician to the Evelina Hospital for Children, on the relative importance of environment and diet,[1] and the other by Professor Korenchevsky, on the etiology and pathology of rickets from the experimental point of view.

The first report is a valuable contribution to the very vexed but highly important problem of the nature of the factors causing rickets. Animal experiments have shown that in young animals a large number of factors are capable of causing bony changes, which are apparently identical with clinical rickets. Mellanby's work emphasized the importance of vitamin A deficiency in the causation of rickets in puppies,[2] but in a more recent report[3] he has stated that attention must also be given to other factors, such as an excess of carbohydrate in the diet, in the causation of the disease. American workers have shown that deficiency of calcium and of phosphates may cause rickets in experimental animals, and observations on children have made it plain that the problem of the causation of rickets by dietary deficiencies is complex. The general opinion is that rickets cannot be attributed solely to lack of vitamin A, but any theory of its etiology must take cognizance of the fact that cod-liver oil has a remarkable preventive and curative effect. Paton and his co-workers have throughout maintained that the chief causes of rickets are deficient exercise and bad housing conditions, and this view was supported by investigations upon Glasgow children,[4] which showed a relation between bad housing and the incidence of the disease. The view that rickets may be produced in this way has received powerful support from recent American work, which has shown that both sunlight and ultra-violet light prevent or cure rickets in animals. Similar conclusions were reached independently by Miss Chick and her co-workers, who made extensive observations on rickety children in Vienna.

Scientific investigations have therefore revealed the fact that an embarrassingly large number of factors are involved in the production of rickets. Rickets, however, is one of the most widely spread diseases of infancy. Hess, indeed, has stated that 75 per cent. of children living in the temperate zone are affected. This may, we hope, be an exaggeration, at any rate for Europe; but it must be admitted that the slighter forms of rickets, which do not produce obvious deformity and can only be diagnosed with certainty by *x*-ray examination, are important causes of ill health. The severer forms which produce obvious deformity may fairly be described as a grave social menace on account of the lifelong impairment of efficiency they cause, and in the female sex of the pelvic distortion that they may produce. Obviously it is of vital importance to know what is the cause of the prevalence of the severer types in England and Scotland, and particularly whether the most important factor is to be found in errors in infant feeding or in bad housing, as suggested by Professor Paton and his co-workers. This is the practical problem which Dr. Corry Mann has investigated.

The children observed were attending the out-patient departments of the Evelina Hospital or of Guy's Hospital, or certain infant welfare centres in London. The cases of rickets numbered 533, and of these 449 showed slight or severe deformity. As a control 428 normal children were examined; of these, 242 belonged to families free from rickets, and 186 were members of families in which a case of rickets had occurred. The cases were followed for periods extending to a year or eighteen months; clinical examinations were made and careful investigations as to the home conditions in which the children lived were conducted by trained lady health visitors. The chief points studied were the income of the parents, the housing conditions, and the diet. The results, which are fully set forth in a series of well-arranged tables, point to certain very definite conclusions. There was no evidence that bad housing, overcrowding, or deficient air space, were responsible for the occurrence of rickets. The control cases and the rickety children appeared to be living under exactly similar conditions. On the other hand, clear evidence was obtained that certain errors in diet conduced to the development of rickets. Of the 242 cases of non-rachitic children in families free from rickets 77 per cent. were fed either by breast, or on fresh or dried milk, or on a combination of breast and fresh or dried milk, while only 11.4 per cent. were fed partly or entirely on condensed milks. Of the 533 cases of rickets, however, only 28 per cent. were fed either by breast or on fresh or dried milk, or on a combination of breast and fresh or dried milk, while 30.3 per cent. were fed partly or entirely on condensed milk.

The most important conclusion of the author is that "if a wide survey is taken of the conditions which predispose to the occurrence of rachitic deformities in children under the age of 2 years, the continual use of an unbalanced diet, characterized by deficiency of fat and excess of carbohydrate, will be found to have antedated the appearance of symptoms in about 45 per cent. of the total cases." This conclusion is of great practical importance, for it indicates clearly that, of the possible factors which can cause rickets, the most important factor actually producing the disease in the poorer quarters of London is improper infant feeding.

There is no doubt that lack of sunlight and of fresh air dispose to rickets, and that exposure to sunlight can cure rickets. The work of Paton and his co-workers definitely suggested that these hygienic factors were chiefly responsible for the incidence of rickets in Glasgow. The work of Dr. Corry Mann shows equally clearly that in South-East London rickets is chiefly caused by improper diet. Possibly the reason for this difference is that in London the housing conditions are not as bad as in Glasgow; indeed, it is specifically mentioned that in

[1] *Rickets: The Relative Importance of Environment and Diet as Factors of Causation.* An investigation in London by H. Corry Mann, O.B.E., M.D. Medical Research Council, Special Report Series, No. 68. 1922. (Pp. 99. 2s. 6d.)

[2] *Report on the Present State of Knowledge Concerning Accessory Food Factors (Vitamins).* Medical Research Council, Special Report, No. 38. 1919.

[3] *Experimental Rickets.* By E. Mellanby. Medical Research Council. Special Report, No. 61. 1922.

[4] *A Study of Social and Economic Factors in the Causation of Rickets, with an Introductory Historical Survey.* By L. Findlay and Margaret Ferguson. Medical Research Council, Special Report, No. 20. 1919.

the London report very few evidences of overcrowding, lack of cleanliness, and want of ventilation were observed. The poverty of the district investigated is, however, notorious, and the combination of moderate housing conditions with great poverty must tend to bring the dietary factor into prominence. The conclusion that in London rickets is due chiefly to improper diet is encouraging, for dietary defects can be remedied much more easily than can bad housing.

Professor Korenchevsky's experiments, to which we hope to recur on some future occasion, lead him to attach considerable importance to the existence of an hereditary factor. It is, he says, impossible to deny the existence of a congenital disease of the skeleton, if not of a rachitic character, at any rate predisposing to rickets. He considers that the most important factors for the prevention of rickets are an adequate amount, in the mother's diet, of an anti-rachitic factor, calcium, and phosphates during pregnancy, especially during lactation, and also the presence of the same substances in the infant's diet, combined with abundant light, fresh air, and muscular exercise. He also thinks that the presence of the substances mentioned in the father's diet may be of consequence.

Dr. Corry Mann's report contains some interesting information regarding the results of the work done at infant welfare centres. He states that during the two years April, 1919, to April, 1921, there was a rapid diminution in the number of cases of rickets, and that severe cases of deformity have become rare. "Rickets," he continues, "is not only becoming much less frequent, but such incipient cases of rickets as occur are almost invariably checked in the pre-rachitic stages by coming into touch with a welfare centre. The evidence obtained by this investigation suggests plainly that in ten years' time, so far as London is concerned, rickets will be relatively uncommon. No more conclusive proof can be given of the valuable work which the welfare centres are doing than these records, which indicate that where in a family the earlier children have been rickety, the later children, who alone have been under supervision of a welfare centre, and fed under the assistance of that agency, are free from rickets. This successful control has been noticed repeatedly." These are very encouraging words, and it is gratifying to learn that the labour and money that have been devoted to the development of the infant welfare centres are yielding such valuable results.

SOME FEATURES OF MYOTONIA.

THE rapid progress which medical science has made in the last fifty years has left untouched many forms of disease, some in spite of their ubiquity, others because of their rarity. Among the latter are many of the hereditary disorders which affect the neuro-muscular mechanism, of which we know little beyond the clinical manifestations and the gross pathological changes. The *causa causans* and the means whereby it effects the morbid results seem to remain as far as ever from our grasp. Among such hereditary diseases is myotonia congenita, which was so intimately described by Thomsen in 1876. Its essential nature has so far completely baffled neurological investigations, and we are therefore still content to compile clinical observations in the hope that they may throw new light on the disease. For that reason we welcome the interesting paper by Rosett in the first number of the new volume of *Brain*. He describes an American family in which eight cases of the disease occurred in three generations. This family presents several points of interest. The grandparents were English. The husband, a big, powerful, and fair man, was healthy in every respect. The wife, a brunette of medium size, was of a nervous disposition, and also became affected in middle life with myotonia; this was most troublesome during the last ten or twelve years of her life. They had six surviving children, three of whom took after their father, while three resembled their mother. Those who resembled the father, and inherited his large muscles, inherited also their mother's myotonia. The others inherited their mother's nervous disposition and were liable to attacks of depression. In the third generation again those who resembled the big fair Englishman were affected with myotonia, while the others were normal. It seems as though this type of build and musculature were a soil on which the sensitive plant of myotonia, which appeared late and in a mild form in the grandmother, could flourish and develop into full maturity.

The hypothesis that some familial and hereditary diseases require the blending of two different strains has been suggested recently by Hall of Copenhagen in his study of hepato-lenticular degeneration. The way in which the cases occurred in the family he investigated suggested that the germ, A, of the disease is transmitted to several members of a family, possibly to every member, but only develops in the individual when another factor, B, is also transmitted. This factor B is much more common than A, but still sufficiently uncommon to allow only a small proportion of those affected with A developing the disease. Similarly in Rosett's family of myotonia we have on one side the germ of myotonia; on the other the much more common factor of big musculature, and an inheritance of both is necessary before the individual becomes myotonic.

The description of the cases of myotonia also brings out some interesting observations. One case, a woman in the second generation, was not affected until the age of 23, near the end of her second pregnancy. At that time and since then sudden attacks of myotonic spasms were induced by sudden emotion, such as fright, and affected all those muscles of the body which were in use at the time. Thus when standing she fell to the floor "like a log of wood," but when sitting only the muscles above the waist were affected. Except for these attacks she noticed none of the symptoms of myotonia, although the muscles gave a modified myotonic response on direct percussion. Four of her children who resembled her and their grandfather also showed myotonic phenomena n greater or less degree. Two girls were typical cases of the affection. The other two, a boy of 10 and a girl of $3\frac{1}{2}$, showed no myotonic symptoms, but their muscles responded on testing with the myotonic reaction.

The relationship of myotonia with voluntary nervous control and with the autonomic and endocrine systems has within recent years been the subject of much speculation and some experimental observations. It has long been known that the myotonic reaction is only elicited by certain types of stimulus. Thus direct tapping of the muscle usually results in slow relaxation, but when the patellar and Achilles tendons are tapped in testing the knee and ankle jerks the muscles relax normally and rapidly from their contractions. Again, weak and short electrical stimuli produce a normal flicker in the muscle, whereas stronger or longer faradization gives a contraction which persists long after the stimulus ceases. Electromyograms of voluntary contractions show that the nervous impulses recorded by the string galvanometer only continue so long as the patient wills the contraction; but long after the string has ceased to vibrate the muscle remains in the same state of contraction as before. Clearly, therefore, the myotonic phenomenon is not under the control of the central nervous system.

But some measure of control by the sympathetic and endocrine systems is suggested by several observations. Thus, in the case recorded by Rosett emotional disturbance very rapidly brought on a severe attack of

myotonia, which persisted for nearly five minutes. Griffith, in 1912, recorded an interesting family in which a mother, son, and daughter were affected. The mother suffered from myotonia in a typical form, but only for a very short period—namely, during the last few weeks before the birth of her boy, who was her second child. Up till then, and from her confinement onwards, she had no symptoms of the disease. The boy was a typical case, and up till manhood, when he was observed, suffered from no remission in the severity of the symptoms. His elder sister suffered from myotonia from childhood, but not so severely as her brother. She married and had several children, and she noticed that, although during her pregnancies her symptoms were considerably worse, after her confinements they improved to such a degree that each successive pregnancy left her less affected than before, so that at the time of examination the disability had almost completely left her. Other writers have noted the bad influence of pregnancy on the symptoms of myotonia, but this mother and daughter appear to be unique in experiencing the curative effects of the confinement.

Work on the metabolic aspects of the disease has been scanty and inconclusive. Cases are rare, and the patients seldom wish to be the subjects of thorough investigation, and it must be confessed that up to the present no satisfactory method of studying the metabolic exchanges in a living muscle has been devised. Still it is likely that before long progress will be made in this direction which may lead to a fuller knowledge of the conditions governing muscular contraction and relaxation, and to a rational method of treatment for sufferers from myotonia.

HODGKIN'S DISEASE.

A SAD interest attaches to the article on Hodgkin's disease published this week (p. 1201). Sir James Galloway was preparing a post-graduate lecture on the subject at the time when he was taken ill, and it was in his mind at the last. The notes he left have, as an act of piety to his friend, been put together by Sir William Hale-White, who has little doubt that the lamented author had intended perhaps to expand the lecture and almost certainly to complete it by some further discussion of the observations and theories he recorded. Even as it stands now it well illustrates Galloway's qualities as a physician and his attitude towards the more modern methods of studying disease. While he put first clinical observation, coupled in any particular case before him with a consideration of the individual patient, he always had in mind the institutes of medicine, and was ever ready to study the suggestions continually flowing from physiology and pathology into the broad stream of medicine. The lecture affords more than one illustration of this. The discovery that the urine in the first case he relates contained a peculiar protein at once aroused his attention. He recognized that it resembled Bence-Jones's albumin, and sought the expert help of Mr. Sydney W. Cole, who established the fact that the substance was a new protein, differing from Bence-Jones's albumin in the respects briefly stated in the lecture. We may express the hope that Mr. Cole may shortly publish a fuller account of it, and that other physicians will look out for it in similar cases. Early in his career Galloway had given special attention to diseases of the skin, and the descriptions in this lecture of the cutaneous manifestations to be observed in Hodgkin's disease are of great value; commonly these manifestations are mentioned only briefly in textbooks, and yet they may be of very considerable importance. That the pruritus occasionally observed may be so intense as gravely to affect the patient's general condition is a valuable observation. The further statement that arsenic, a favourite remedy in the disease, may increase the pruritus, is a useful clinical point. The etiology of Hodgkin's disease is still obscure; Galloway, in pointing out that it is a general specific disease associated with progressive infection of susceptible structures, ranged himself with those who hold that the poisoning is of an infective and, in all probability, a parasitic nature. This view is supported by the occurrence of pyrexia, of which a very good example is given, the temperature being plotted in the way recently suggested by Dr. Arthur Hall in the *Quarterly Journal of Medicine*. The periodicity of the temperature may depend on the life cycle of the hypothetical parasite. Finally the observations on the value of *x*-ray treatment are worthy of note: others also have seen the treatment do great good, and it seems clear that its application to the glands of the chest may relieve urgent symptoms.

THE PREPARATION OF INSULIN.

THE success of Banting and Best in obtaining, under laboratory conditions, an extract of the islands of Langerhans, and the effect of the injection of this extract on the blood sugar, has naturally attracted a great deal of attention. The account given in our columns by Professor Macleod (November 4th, p. 833), under whose superintendence the researches have been carried out in the Physiological Laboratory of the University of Toronto, has been, of course, very carefully studied by physicians and physiologists. It has also, naturally enough, aroused the interest of the general press, and in some cases the motive of the University of Toronto and of the Medical Research Council in taking steps to protect the method of manufacture, so that its commercial production should be carried out in a proper manner and with proper safeguards, has been misunderstood. The fact is that the preparation of insulin, even on the laboratory scale, is not free from difficulties and risks, and these become greater when its production on a large scale is attempted. Interest in the subject has also been displayed in the House of Commons, where a question was asked last week, the member who put it being under the impression that the preparation of insulin had passed beyond the experimental stage, and that there was an attempt to make it a Government monopoly. The Minister who replied said that everything had been done by the Medical Research Council to accelerate the production of insulin and that there was no thought of any Government monopoly. This, we believe, is quite well understood by the commercial firms engaged in the production of organic extracts; while ready to undertake the manufacture of insulin, they are properly averse from embarking on the project until a suitable method of manufacture on a large scale has been elaborated by the scientific experts. The reports published by Banting and Best of their original method of preparing insulin, and of its modification and improvement, have been closely examined by physiologists in this country, and a certain number of criticisms have been heard. One expression of them is to be found in the letter from Dr. Ffrangcon Roberts published in our issue last week (p. 1193). The points made by Dr. Roberts are of a technical kind, and the terms in which they were expressed, it must be admitted, were wanting in urbanity. Dr. H. H. Dale, who visited Toronto this autumn, has dealt with this aspect of the matter in a letter published elsewhere (p. 1241). While inviting Dr. Roberts to put his theories to the test, Dr. Dale states that no one can deny that a discovery of first-rate importance has been made. That this opinion is widely held is shown not only by the interest excited in this country and in America, but by the letter from Dr. Carrasco-Formiguera, of the Catalonia Institute of Physiology, Barcelona, published in our issue of December 9th. In the same issue were printed some "armchair reflections" by Dr. Otto Leyton, who showed anxiety lest the cost of insulin as prepared at present should prove prohibitive if made in London; he also expressed the hope that some other ferment, much more easily prepared, might be found to possess a similar property. He concluded by stating that preparations were being made to test the zymase group in the laboratories of the London Hospital Medical College. This is, of course, as it should be, and we may hope that the impetus given to the study of the functions of the pancreas by the Toronto experiments will not soon be lost. Lord Knutsford has never been backward in making an appeal to the benevolent in the interests of

humanity or of the great hospital of which he is chairman. We should, therefore, not have been surprised to read an appeal from him for funds to carry out the suggested experiments in the laboratories of the London Hospital Medical College. So far as we are aware he has not made any such appeal. There has, however, appeared in the *Daily Telegraph*, and at least one other London newspaper, a long letter signed "Physician to a London Hospital," stating that since the cost of each dose of insulin must be great, and since it is probable that improvements in the method of production will shortly be made—so that it would not be a reasonable financial proposition for any manufacturing chemists to embark on the preparation of insulin—the work should be undertaken on a voluntary basis and the cost defrayed by subscriptions from the benevolent. The writer thinks that if we are to wait until the method of production of insulin improves we must wait indefinitely. There is some reason to hope that he may prove to be mistaken in this; in any case, it seems to us that on his own showing it is premature to make an appeal for £30,000 to put up a factory to make 400 doses a day, although this is, in his opinion, the largest amount that could be made in London. The writer goes on to suggest that as it will be impossible to make all the insulin required it will be "only fair that those who subscribe substantial sums to the fund should have the right to nominate individuals to whom some of the pancreatic extract should be supplied." It falls to him, he says, to make the appeal, because his responsibility for cases of severe diabetes mellitus is heavier than that of anybody else. Exactly what this statement means we do not pretend to say, but no doubt the writer is strongly impressed with the necessity for immediate action, for he appeals for subscriptions to be sent to "G. Jodrell, 92, Portland Place, W.1," which is the same address as that from which Dr. Otto Leyton sent us the letter published on December 9th. We have no doubt—we may perhaps go so far as to say we know—that the Medical Research Council is losing no time. The method by which insulin may best be prepared is the subject of intensive investigation, and the Council is anxious to place the perfected method in the hands of responsible commercial firms at the earliest possible date. In these circumstances we are inclined to think that the benevolent would be better advised to send their contributions to the Treasurer of the Medical Research Council, the Right Hon. F. B. Mildmay, 15, York Buildings, Adelphi, W.C.2.

EXPERT WITNESSES.

IN our issue of September 16th (p. 531) Mr. C. H. Fagge wrote a letter criticizing the method in which medical evidence is called both for the plaintiff and for the defendant in the courts. This was followed a fortnight later (p. 614) by a letter from Sir John Lynn-Thomas describing the course of action he had come to adopt when asked to give expert evidence. The publication of this induced Sir Clifford Allbutt to address a letter to Sir John Lynn-Thomas, which, with the writer's permission, is published in this issue (p. 1244). We are very glad to be able to do so, for Sir Clifford Allbutt's description of the plan adopted at Leeds to secure preliminary consultation between medical practitioners called to give expert evidence on either side in cases before the courts is of more than passing interest. Conditions have changed in many respects since the plan was devised, but the need for a more scientific basis for the trial of these cases has increased rather than diminished with the progress of specialization. The present practice, as Mr. C. H. Fagge pointed out, "scarcely advances medical prestige or makes for equity." This being so, it is difficult to account for the general failure to adopt the procedure followed with such signal and deserved success at Leeds, the more so because the attention of the profession has already been directed both to the importance of the principles involved and to this demonstration of their practicability. The question of providing for preliminary consultation between medical witnesses was raised by the Scottish Committee of the British Medical Association in 1903 and was referred to the Divisions. A detailed memorandum on the subject was circulated and a substantial majority of those Divisions which replied expressed themselves in favour of the principle of consultation. A report made by the Medico-Political Committee to the Representative Body at Leicester in 1905 was to the effect that opposition to the scheme arose, in the main, from a fear that the suggested consultations might, in the eye of the law, constitute "collusion" between witnesses, or that it would not prove acceptable to parties to the cases or their legal advisers. On these points the opinion expressed by the Committee appears equally applicable to-day. After calling attention to the practical success of the Leeds experiment the Committee observed that the term "collusion" is inapplicable to a consultation for the purpose of securing a joint conclusion as to facts, and expressed the belief that "as soon as the more ethical procedure herein indicated has become the recognized practice of the medical profession, any objection which lawyers or their clients might entertain to consultation between their medical witnesses would tend to be regarded as an indication that there was some element in the case which would not bear unbiased examination. Consequently the practice of raising such objections would prejudice the case of the party objecting, and in a short time would cease."

MEDICAL INSURANCE AGENCY.

A MEETING of the Committee of Management of the Medical Insurance Agency was held on Thursday, December 14th, 1922, at the offices, 429, Strand. Dr. G. E. Haslip, the Chairman of the Committee, presided, and the members present were Sir Squire Sprigge, Sir Dawson Williams, Dr. E. Weaver Adams, Dr. H. A Des Vœux, Dr. R. A. Gibbons, Dr. Langdon-Down, Dr. Alfred Cox, and Mr. W. E. Warne. The Chairman presented an interim report from which it appears that the Agency continues to progress and to flourish. That those who have taken policies of assurance and insurance through the medium of the Agency are well satisfied is amply demonstrated by the renewals no less than by the expansion of the business, largely through recommendations. During the nine months ending September 30th, 1922, new life contracts to the number of 114, representing £94,023, were negotiated, bringing the total of life assurances effected through the Agency to over £600,000. The renewals of motor car insurances also have been well maintained; during the period under review there was an increase of 80 new policies. It is hoped that the advantages to be derived from utilizing the services of the Agency will be even more effectively placed before the profession in 1923. Other branches of insurance show an equally satisfactory state of affairs. The subcommittee which was appointed in June last to consider the means whereby such funds as might be made available could be best applied to the educational benefit of the children of medical practitioners presented a report showing that consideration had been given to the position of the daughters of deceased or disabled medical men. Dr. Louisa Martindale had consented to assist, and her special knowledge and sympathetic understanding of the problems of female education had been of great assistance. After full consideration the Committee came to the conclusion that the best thing to do at the present stage was to select girls of about 12 to 14 years of age and to defray the cost of their education and, where necessary, their maintenance at school until about the age of 18 years; the subcommittee was invited to submit a detailed scheme to the next meeting. The Secretary (Mr. Ferris-Scott) announced that the sum of £965 was available for distribution to the medical charities, and it was resolved to allot £400 to the Royal Medical Benevolent Fund Guild, £210 to the Royal Medical Benevolent Fund, £105 to the Epsom College Benevolent Fund, and to reserve £250 for the proposed educational grants to girls. At its last meeting the Committee allotted 200 guineas to each of the first three charities mentioned. As the result of the distribution now to be made the total sum subscribed to medical charities by the Medical Insurance Agency since 1910 exceeds £10,000.

LIFE AT HIGH ALTITUDES.

MOUNTAINEERS and airmen combined in a discussion on the medical aspects of life at high altitudes at the meeting of the Section of Medicine of the Royal Society of Medicine on December 15th. Dr. T. G. Longstaff, a member of the most recent expedition whose object was to reach the summit of Everest, gave an interesting account of the experiences of himself and his colleagues, and showed some striking photographs. One of the greatest difficulties encountered by the party was, he said, excessive thirst, for at very high altitudes snow and ice did not melt into water, but went straight into watery vapour. Oxygen was, he believed, the best protection against frostbite. Of two parties ascending Everest one used oxygen and the other did not; in the first frostbite was only very superficial, whereas the other suffered severely. The party using oxygen ascended more quickly than the other, but was slower in the descent. Remarkable personal variations were observed; one member of the party became so acclimatized that he was able to spend three nights and four days consecutively and comfortably at a height of 23,000 feet. Mr. T. H. Somervell, another member of the Everest expedition, stated that for several successive evenings, at 16,500 feet, he had Cheyne-Stokes breathing when lying down to sleep, but it passed off. At 27,000 feet his breathing was much deeper than at sea-level, and the rate was 55 to 60; during the climb his pulse rate varied between 180 and 200. Mr. J. Barcroft, speaking of the experiences of the recent expedition to the high Andes, said that the response to high altitudes included vomiting, headache, occasionally epistaxis, and some difficulty with vision and hearing; also among various people irritability of temper, trouble with the appetite, and some difficulty about doing work. The normal saturation of arterial blood with oxygen was at sea-level 96 per cent. of the possible; at high altitudes it ranged between 82 and 91 per cent., and the arterial blood was practically as dark as the normal venous blood. The oxygen pressure in the blood was also deficient in these cases, being 60 mm. only, as against the normal 100 at sea-level. Yet there was more oxygen in each cubic centimetre of blood at high altitudes than at sea-level, the reason being that there so much more haemoglobin was present. The climatic conditions were found to produce hypertrophy of the bone marrow. The blood of each member of the Andes party was so altered in its chemical properties that at any given oxygen pressure it combined with more oxygen than it had done at sea-level. Professor J. C. Meakins, who was also a member of the Andes expedition, said that to him the striking feature resulting from the stay of the party in the high Andes was the development of cyanosis; it resembled that seen usually in a bad case of pneumonia, and the violet hue persisted during the whole time. Among the natives of these Peruvian mountains club-fingers were common, quite apart from cardiac or pulmonary lesions. Among them also there was a distinct increase in the width of the chest in comparison with its height. After the eighth day of residence an examination of the party showed that the heart had become smaller, but this was less noticeable in those who did not stand the altitude well. Wing Commander Martin Flack, Director of Medical Research, R.A.F., said that in the case of the airman the change of altitude was very sudden, and his stay in the high altitudes brief; there was no increase in haemoglobin, and no increase of corpuscles even with diminished haemoglobin content. There might be a certain amount of acclimatization of the lung epithelium, by which, after a time, the aviator was able to get an extra amount of oxygen into his blood. It was to be remembered that the aviator sat in his machine, whereas the mountain climber trudged up steep inclines. The first effect of high flying was deepened breathing, and in some cases this amounted to real distress. The pulse rate usually rose, and the blood pressure also in a high flight, though if the blood pressure subsequently fell it never, in the fit man, sank below the normal unless the altitude flight was very prolonged. Muscular weakness was pronounced; even the working of the camera shutter seemed to call for enormous effort. Judgement and perception also were impaired, and in a prolonged flight the respiratory capacity became lessened. Oxygen tended to abolish the effects due to defective circulation and nervous instability. Flight Lieutenant W. D. Faringdon said that at 18,000 feet an appreciable effort was needed even to pick up a map from the cockpit of the machine. At that height the impairment of judgement was apt to be marked, and special care had to be taken over the movements, otherwise almost automatic, involved in taking a photograph. When a height of 18,000 feet was rapidly attained the distress was at first very great, but it passed off in fifteen minutes; it was less pronounced if from two to two and a half hours were occupied in reaching this altitude. Mr. Malcolm Hepburn, F.R.C.S., a member of the Alpine Club, considered acclimatization to be a question of the oxygen-carrying capacity of the blood. If the persons doing such a great climb as that of Mount Everest could accustom themselves to doing with a smaller supply of oxygen than the normal they need not despair of being able to accomplish this supreme feat. But definite training should be undertaken, suitable food supplied, and the ascent should be slow. Dr. J. S. Haldane said that his experience confirmed nearly all the statements other speakers had made as to the effects of high altitudes. He still adhered to the conclusions he arrived at as a result of the Pike's Peak experience. The pressure of oxygen in the arterial blood was not normally in equilibrium with the pressure of the oxygen in the alveolar air, and by all sorts of modifications in the breathing it was rendered far from equal. The account of the experiences on Everest given by Dr. Longstaff was made more vivid by some remarkable photographs, which were shown to the Section.

AN OUTBREAK OF DYSENTERY IN WALES.

DR. T. W. WADE'S report to the Welsh Board of Health on the occurrence of bacillary dysentery in the Ogmore and Garw Urban District, in the county of Glamorgan, has been issued by the Ministry of Health, with a prefatory note by Sir George Newman.[1] It is the record of a very thorough investigation. Ogmore, a district in the South Wales coal-field, is a narrow valley running north and south; flat-topped hills on either side prevent much lateral communication, and the only outlet is at the southern end. The outbreak began suddenly about May 11th, 1921, with explosive intensity and without the occurrence of previous cases to give warning. On May 18th Dr. Anderson, who is in practice in the valley, reported a serious prevalence of diarrhoea, with fever, tenesmus, and blood-stained and slimy evacuations, among the children in one district in this valley. The medical officer of health, Dr. Murphy, found that, besides young children, older children and adults were suffering in the same way. All the signs pointed to a water-borne infection. During the outbreak, which lasted until the end of August, the total number of deaths was 12; the infection was thus comparatively mild. The cases seen by doctors numbered 548 (a case mortality of 22 per cent.); but from house-to-house inquiry it appeared that the total number of diarrhoea cases had been somewhere about 1,100. The causative organism of the disease was proved to be *B. dysentericus* Flexner (strain W). The outbreak was limited at first to a defined area supplied by water from a particular main, and the houses nearest the source of supply were those most seriously affected. A group of houses supplied with water from a private source, though situated near the middle of the invaded district, escaped almost wholly. Exhaustive inquiry failed to show how the water became contaminated by the specific organism. The Fronwen brook (which fed the contaminated area) was supplementary to the main water supply of the district. While the Fronwen gathering ground was good, and its water chemically and bacteriologically fairly good, yet in its course to the main it was open to contamination by wayfarers. No rain fell from the 1st to the 7th of May.

[1] *Reports on Public Health and Medical Subjects.* No. 14. H.M. Stationery Office. 1922. (Price, post free, 1s. 1d.)

On May 7th there was 0.86 inch of rain; on May 8th 0.51 inch, and slight rain fell on May 9th, 10th, and 11th. The epidemic first noted on May 11th was at its height on May 13th. The inference that the dejecta of a dysentery carrier was washed into the Fronwen brook and that this caused the epidemic seems reasonable. That the carrier may have acquired his organism in the trenches of the western front is an attractive speculation, based on the fact that very many of the 38th Welsh Division now live in the district and bacillary dysentery was prevalent in their part of the line. Three ex-soldiers, discharged from the army with dysentery, were found, but although two of these lived near the source of this water supply no connexion could be traced between them and the outbreak. Dr. Wade remarks, however, that this organism may probably be a commoner inhabitant of the human intestine in this country than is generally supposed. The epidemic, having started from the definite water source, spread later by case-to-case infection, but not to any great extent. The measures taken were as follows: the water in the main has been chlorinated, and the Fronwen water is now piped for such a distance that casual contamination is unlikely.

SOCIÉTÉ INTERNATIONALE DE CHIRURGIE.

THE sixth triennial Congress of this society will be held in London from July 17th to 20th, 1923, under the patronage of His Majesty the King and the presidency of Sir William Macewen, C.B., F.R.S. The meetings will be held at the Royal Society of Medicine, 1, Wimpole Street, W.1. The subjects chosen for discussion are: (1) The surgery of the endocrine glands with the exception of the thyroid; (2) Arthroplasty; (3) The late results of surgical intervention in traumatic lesions of the peripheral nerves; (4) Serum and vaccine therapy of surgical infection with the exception of tetanus; (5) Operative shock. According to the provisional programme the inaugural meeting will take place on Tuesday, July 17th, at 11 a.m., when H.R.H. the Prince of Wales has graciously consented to open the Congress. Scientific sessions will be held on Tuesday afternoon and on Wednesday, Thursday, and Friday mornings. Operations and demonstrations will be arranged at the various hospitals on the last three days of the Congress. A collection of pathological specimens illustrating diseases of the endocrine glands will be on view at the Royal Society of Medicine. Hospitality will be extended to members of the Congress by His Majesty's Government, the Lord Mayor of London, the Royal College of Surgeons, the University of London, and the Barbers' Company. The organizing secretaries are Sir D'Arcy Power, K.B.E., and Mr. J. E. H. Roberts, O.B.E. The British secretariat is at 26, Harley Street, W.

MEDICAL GOLFING SOCIETY.

THE second annual dinner of the Medical Golfing Society was held at the Grand Hotel, London, on December 14th, and was followed by the annual general meeting. The President, Dr. Rolf Creasy, occupied the chair. The rules of the Society were revised so as to provide for the annual election of the officers, and for the continuance in office of the committee for three years, a third of their number to retire annually. A general discussion of the Society's business took place and the following officers and committee were elected for the ensuing year: President, Dr. Percy Kidd; Past-President, Dr. Rolf Creasy; Captain, Mr. H. D. Gillies; Match Secretary, Dr. H. Gardiner Hill; Secretary and Treasurer, Dr. Rolf Creasy, jun.; Committee: Dr. J. Clarke, Dr. R. Creasy, Mr. G. Dawson, Sir K. Goadby, Dr. G. E. Haslip, Mr. T. P. Kolesar, Dr. G. Norman, Sir M. Rees, Mr. J. Swan. Two successful golfing meetings have been held during the past year. The summer meeting took place at Stoke Poges, and the autumn meeting at Littlestone; the results of the various competitions were briefly reported in our columns. Owing to the reconstitution of the Club it was not possible to hold many matches in 1922, but the Captain, Sir Milsom Rees, was able to arrange matches against Royal Wimbledon, Sidcup, and the Stage Golfing Society, the two former being lost and the latter won. It was decided that the subscription should remain at 10s. The interest taken in golf by members of the medical profession is at least as great as that of any other calling, and the Medical Golfing Society may well look forward to a future of increasing prosperity.

THE FIRST WOMAN VETERINARY SURGEON.

THE Royal College of Veterinary Surgeons, which is the only body empowered to grant a diploma in veterinary medicine and surgery, has hitherto refused to admit women. The Sex Disqualification (Removal) Act has settled the question of the admission of women to the professions, and on Wednesday last Miss Aleen Cust was admitted a Member of the Royal College of Veterinary Surgeons. She is the first woman to obtain the diploma. Miss Cust, who is the daughter of the late Sir Leopold Cust, Bt., and the sister of Sir Charles Cust, equerry to the King, decided while still a girl to devote herself to veterinary work. She passed through the full curriculum of four years at the Edinburgh Veterinary College with distinction. Although the Royal College of Veterinary Surgeons refused, on the ground of sex, to grant her its diploma, Miss Cust determined to follow her vocation; she established an extensive veterinary practice in the West of Ireland, and was for ten years veterinary inspector under the Galway County Council and the Department of Agriculture in Ireland. During the war she volunteered for service overseas and was appointed by the War Office to a responsible position in the bacteriological laboratory of a veterinary hospital in France. So far as we are aware there are very few, if any, women veterinary surgeons in other countries; we are told that some twenty-five years ago two Russian women attended the Alfort (Paris) Veterinary School, and were subsequently admitted to the Russian State Veterinary Service. Since the Sex Disqualification (Removal) Act was passed the possibilities of the veterinary profession as a calling for women have been perceived by a few, and at the present time there are, we believe, two women students attending the veterinary department of the University of Liverpool, two at the Veterinary College of Ireland (Dublin), and one in Edinburgh. The veterinary profession has been rather a long time following the example of the medical profession in admitting women, but we have no doubt that there is a considerable opening for them, both in practice and in research. The importance of the scientific investigation of diseases of animals, and the light that the study of disease in animals can throw on pathology in general, are now far more fully appreciated than ever before.

DOCTORS IN RUSSIA: A CHRISTMAS APPEAL.

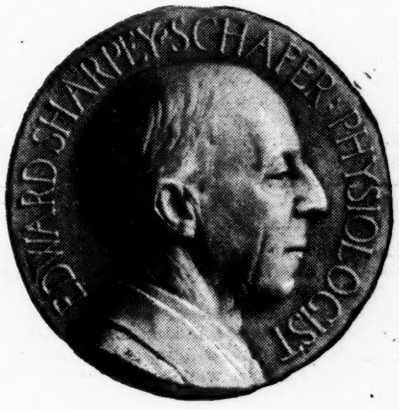
WE commend to the sympathetic notice of every reader of the BRITISH MEDICAL JOURNAL the appeal, signed by the four officers of the Association and printed at p. 1228, on behalf of the starving doctors and their families in Russia. At this season the claims upon the generosity of a generous profession are many. But this second appeal for help for our Russian colleagues in distress is one that will surely find a response. What better relish for a Christmas dinner could be imagined than the knowledge that a gift has been willingly made towards the sending of a food parcel to some famine-stricken medical household in Russia? Subscriptions of 5s. or multiples of 5s. should be sent to Mr. L. Ferris-Scott, Financial Secretary of the British Medical Association, 429, Strand, W.C.2.

A GIFT of two sums of 100,000 francs has been made to the University of Paris by Madame Edouard Nathan. The first of these is intended by the donor to be applied to the improvement of the scientific laboratories of the University, and to the promotion of research work. The second is to be set apart for the purpose of making loans to impecunious students of the University to enable them to continue their studies.

SIR EDWARD SHARPEY SCHAFER, F.R.S.

SOME time ago the suggestion was made that the meeting of the British Association in Edinburgh in 1921 would form a fitting occasion for the presentation to Sir Edward Sharpey Schafer of some token of their esteem from his present and past demonstrators and fellow research workers first in London and afterwards in Edinburgh.

As so many of those who had been trained under him now occupy posts in distant lands it was found impossible to make the necessary arrangements for the presentation at that early date, but Professor Halliburton made a statement at one of the largely attended meetings of the Physiology Section, expressing the desire of all who had been associated with their old master in the prosecution of physiological research to present him with some mark of their esteem and affection, and indicating the form it would probably take. It was appropriate that the announcement should be made in Edinburgh, for Sir Edward Sharpey Schafer has been Professor of Physiology there since 1899.



It was decided that the presentation should consist of a life-size portrait plaque, and that a medal reproducing the portrait and inscription should be offered to each of the many subscribers. The plaque and the medal are the work of Mr. C. d'O. Pilkington Jackson, A.R.B.A., and the portrait is excellent. From the photograph of the medal here reproduced it will be seen that the obverse bears in bold relief the bust of Sir Edward Sharpey Schafer and that the reverse contains a dedicatory inscription. The plaque itself is of bronze and has been mounted on stone with the inscription shown on the reverse of the medal underneath it. At Sir Edward Sharpey Schafer's desire it will eventually be placed within the University of Edinburgh, but at present it remains in the sculptor's studio, as he wishes to exhibit it at the Royal Scottish Academy.

The long list of subscribers includes many of the leaders in physiology and other branches of medical science in this and other lands: a few of them may be named—Bayliss, Rose Bradford, Halliburton, L. Hill, MacWilliam, Mott, Starling, in this country; and Hunter and Tait (Canada), Jolly (S. Africa), Malcolm and Mackenzie (New Zealand), Adds and S. Simpson (U.S.A.), Row (India), Itagaki and others (Japan). Among the original subscribers were two of great distinction who have unfortunately passed away—Augustus Waller and Benjamin Moore.

The profession will join in congratulating Sir Edward Sharpey Schafer on this spontaneous tribute from his old pupils and fellow workers to his eminence as a physiologist, and to the inspiration of his teaching, and also in the hope that he still has before him many years of successful work.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Prorogation.

PARLIAMENT was prorogued by Royal Commission on Friday, December 15th, after the Royal assent had been given to several measures, including the Importation of Cattle Bill. The new Session will open on Tuesday, February 13th.

Insulin for Diabetes.—Sir William Bull asked, on December 13th, whether the Medical Research Council was throwing obstacles in the way of the general production of insulin as a remedy for diabetes; if, as knowledge of the remedy had passed the experimental stage, the Minister of Health could arrange that the manufacture should be left to private enterprise; and whether the system of licences granted by the Medical Research Council to authorized persons would afford ample protection to the public and make the remedy available much sooner than by keeping it a Government monopoly. Sir M. Barlow said that the Medical Research Council was doing everything in its power to accelerate the production and use of insulin. The assertion that the remedy had passed the experimental stage was not in accord with the experience of other countries or the best scientific opinion here. There was no question of any Government monopoly and the suggestion as to manufacture was on the line which the Council had been diligently pursuing for some time past.

Medical Department, Ministry of Pensions.—Major Tryon has stated that local practitioners serving on medical boards received the following fees: Chairman, £1 11s. 6d. (for a session of 2½ hours); specialists, £2 2s.; ordinary members or assessors, £1 6s. 3d. Considerable assistance is now given by full-time medical officers of the Ministry, of whom some 200 are liable for this service. The average salaries of these officers is approximately £924 per annum. The total expenditure on payment to sessional members of the boards was, in 1921, £627,795. The corresponding figure for the current year will be more than one-third less, owing to a reduction of the sessional fees payable, and of the number of members of ordinary boards from three to two. Major Tryon has also explained that when whole-time medical officers of the Ministry were not available local practitioners were employed to examine and make detailed reports on pensioners accommodated in institutions not under the control of the Ministry. These medical men received a fee of £1 1s. for one case, and £1 11s. 6d. for two or more cases. No higher fee than £1 11s. 6d. was paid for a visit to any one institution whatever the number of pensioners examined and reported upon.

Vaccine Lymph.—Captain Bowyer asked, on December 14th, why it was that private practitioners were unable to obtain Government lymph. Sir M. Barlow said that the obligations of the Government were limited to the supply of lymph for public vaccination and at present it was not practicable to extend the supply to private practitioners.

Small-pox.—In reply to Mr. T. Thomson, Sir M. Barlow said that the total number of deaths from small-pox in the first eleven months of this year was 27. Twelve of these cases had been vaccinated, 11 were unvaccinated, 3 showed no evidence of vaccination, and one was vaccinated during the incubation period of small-pox. The total number of cases of small-pox occurring in vaccinated persons during the eleven months was 271, and the percentage rate of deaths to cases in this class, irrespective of age, was 4.4. The total number of unvaccinated cases, including those which showed no evidence of vaccination, or were vaccinated only during the incubation period of small-pox, was 625, and the percentage rate of deaths to cases in this class, irrespective of age, was 2.4. In 6 cases no information was available as to vaccination. There were no fatal cases among vaccinated persons under 35 years of age.

Insurance Medical Services.—Sir Montague Barlow informed Mr. Gould, on December 13th, that no medical practitioner working single-handed under national insurance might have more than 3,000 persons on his list, and in a considerable number of areas a lower maximum of 2,500 or 2,000 had been fixed. Taking the country as a whole the average number of insured persons per doctor was approximately 1,000, and the corresponding remuneration, including milage payment, would be slightly less than £500 a year. On a question as to the procedure, if an insured person desired attention from his own private doctor, Sir Montague said that an insured person wishing to be treated by a practitioner not under an agreement with an Insurance Committee might apply to the local committee for permission to make his own arrangements. If it were granted a contribution would be given by the committee towards the cost of the treatment. The committee had full discretion in considering applications of this nature. There was no provision in the Acts for any reduction in the contribution on the ground that the insured person did not take up the benefits of the Act.

Surplus of Approved Societies.—At the instance of Viscount Ednam, on December 13th, Sir M. Barlow stated that the total disposable surplus of approved societies and branches in England on the first valuation was about £8,000,000, the major portion of which the members elected to take in the form of an increase of the ordinary cash benefits. Of the balance a sum of £950,596 had been allocated by certain societies for payment to hospitals and convalescent homes during the period from July, 1921, to July, 1926.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

A MEETING of the President and General Council of King Edward's Hospital Fund for London, for the purpose of awarding grants to the hospitals and convalescent homes for the present year, was held on December 13th, with H.R.H. the Prince of Wales in the chair. A resolution was passed expressing deep regret at the death of Mr. John G. Griffiths, who since 1902 had rendered invaluable service to the Fund and to the hospitals.

Financial Statement.

Lord REVELSTOKE (honorary treasurer) said that the sum to be distributed would be £220,000, the same amount as last year. The net income for 1922 was almost exactly £220,000. This estimated total included an anonymous donation of £10,000 given to the Combined Appeal, but earmarked by the donor for the King's Fund, and a sum of about £13,000, representing one-fourth of a full year's interest from the legacies of Lord Mount Stephen and Sir Thomas Sutherland; a full year's interest on these bequests would probably approach £50,000. It had always been realized that the special distributions of the last few years—the National Relief Fund, the King's Fund Emergency Distribution, the Government grants administered by the Voluntary Hospitals Commission, and the Combined Appeal—had been only temporary expedients to tide over a particular crisis and to allow time for developing permanent increases in income. Now that the time had come for concentrating on permanent remedies he submitted that the policy should be to endeavour to increase the annual distribution and therefore the power to encourage and assist the hospitals to develop new sources of income and new methods of controlling expenditure.

Sir WILLIAM COLLINS, in making the annual statement on behalf of the League of Mercy, said that it was practically certain that the League would give not less than the £15,000 given last year to the King's Fund; he hoped it would be more. The total which the League had contributed to the King's Fund would then amount to £339,000, besides £49,065 to extra-metropolitan hospitals.

Grants to Hospitals.

Sir COOPER PERRY presented the report of the Distribution Committee. This stated that the amount now for allocation amongst hospitals was £215,000. The Committee had been concerned again this year, not only with the ordinary distribution, but also with special distributions, to assist the hospitals to tide over the period needed for reorganization of their finances after the war. In March, July, and November of the present year the Committee made recommendations to the Voluntary Hospitals Commission covering in all a total of £147,100, the balance of the sum of £225,000 provisionally allocated to London out of the total of £500,000 voted by Parliament for the whole of Great Britain. In August and October the Committee carried out two distributions on account of the proceeds of the Hospitals of London Combined Appeal—£150,000 in August and £100,000 in October. These were not made on the same basis as the ordinary distributions of the King's Fund, but on a basis announced to the participating hospitals when they were invited to suspend their own special appeals in order to co-operate. The number of hospitals applying for grants out of the ordinary distribution was 112, as against 110 in 1921. In view of the urgent need of maintenance grants, the Distribution Committee had again adopted the principle that grants in aid of schemes of capital expenditure should be limited to cases where the work was particularly urgent and was within a reasonable distance of being carried out. The number of schemes which had reached this stage was larger than last year, and consequently the total amount of the grants recommended in aid of schemes of capital expenditure was larger.

Grants to Convalescent Homes.

Sir ALAN ANDERSON (honorary secretary) presented the schedule of awards to convalescent homes. This year the sum fixed for distribution amongst convalescent homes was £5,000; the amount in 1921 was £3,930, besides £6,070 to consumption sanatoriums; but for reasons set out in last year's report grants were now no longer made to sanatoriums. In distributing the increased amount available for convalescent homes, the Committee gave preference to institutions directly connected with London hospitals, and in dealing with the applications it gave special attention to the question of comparative urgency of need, as shown by audited accounts and balance sheets.

The Hospitals' Combined Appeal.

In regard to the present position of the Combined Appeal, Sir ALAN ANDERSON said that no precise figure of results to date could be given, because a good deal of the moneys collected had not yet been paid over, but the grand total of the Appeal Fund was estimated at £435,000. The intention was to close down the general appeal by December 31st, and to leave in activity only one or two specific appeals which would not be concluded by then. They were now devoting thought to permanent methods of increasing the income of hospitals; one of these was the obtaining of increased support from domestic workers, and the other direction was that of the organization of contributions from wage-earners generally.

Growth of the King's Fund.

The PRINCE OF WALES said that it was exactly twenty-five years since the King's Fund made its first distribution. On December 14th, 1897, the Executive Committee met under the chairmanship of Lord Lister to settle the first distribution report to the Council. The amount distributed in 1897 was £34,000 from the special efforts of the first year, and £22,000 from the estimated annual income. This year £250,000 had already been distributed from the special Combined Appeal, and the amount now being distributed out of ordinary income was £220,000.

Financial Problems of the Hospitals.

The financial problem facing the hospitals and the Fund had enormously increased. The King's Fund was founded to meet a crisis; the hospitals of London had then a deficit of £70,000 on a turnover of £700,000. The King's Fund now distributed £220,000 a year, and yet there was a deficit of £210,000. Had the income of the hospitals fallen off? Were voluntary contributions dying out? Quite the contrary. Hospital income was more than three times what it was. Voluntary contributions continued to increase, and were 50 per cent. more than before the war. The present difficulties were due to the fact that hospital expenditure had increased since 1897 nearly fourfold. There were three causes for this: the increased number of patients, needing more hospitals and bigger hospitals; the developments of medical and surgical science, all costing money; and the rise in the price of everything since the war. The result was that, in spite of the great increase in the King's Fund distribution, there was still a deficit of £210,000. The hospital problem was thus much bigger than it was twenty-five years ago, but, fortunately, the means of dealing with it had also grown. They had, in the report of Lord Cave's Committee, a programme based largely on two things: one was the success of many of the provincial hospitals in organizing workshop contributions; the other was the growth of the King's Fund from a mere collecting and distributing agency into a central administrative body, which, being itself voluntary, respected the independence of the voluntary hospitals. The King's Fund had become the local committee for London, and local voluntary committees had been set up all over the country to do the same kind of work. Moreover (His Royal Highness concluded) the Order of St. John and the British Red Cross Society, through their Joint Council, were now assisting in the solution of voluntary hospital problems.

ROYAL MEDICAL BENEVOLENT FUND.

AT the meeting of the Committee held on November 11th, 1922, 24 cases were considered and £389 10s. voted to 23 applicants. The following is a summary of some of the cases relieved:

M.R.C.S.Eng. (1851), L.S.A. (1864), aged 85. Widower, with two unmarried daughters, aged 62 and 53 respectively, who look after the applicant. His total income from investments is £120 and he receives £80 from married daughters. He was in practice in a country district from 1866 to 1912. Owing to the cost of living applicant finds it hard to make ends meet, the income being inadequate for three people after rent and taxes have been paid, which amount to £55. Voted £26 in twelve instalments.

Widow, aged 45, of M.R.C.S.Eng. and L.R.C.P.Edin. (1892) who died in a sanatorium in May, 1922. Fellow practitioners collected £40 towards the funeral expenses and debts. Owing to enforced removals on account of ill health applicant's late husband was unable to make any provision for his wife and daughter, aged 11. Applicant received £9 from friends and hopes to make about £10 12s. from stocking knitting. Voted £15.

Daughters, aged 58 and 50, of L.S.A.Lond. who died in 1903. Owing to chronic ill health they find it extremely difficult to manage on a joint income of £104; the rent amounts to £34. Relieved fourteen times £189. On the recommendation of the Fund's visitor the grant of £18 was raised to £26 in twelve instalments.

Widow, aged 80, of L.R.C.P.Edin., L.S.A.Lond. who died in 1889. She is now left with a total income of £45, out of which she has to pay rent and buy food. The Guild sent her an emergency grant of £3 and £1 for coal, and the Fund voted £18 in twelve instalments, and a special grant of £7 10s.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, K.B.E., M.S., F.R.C.S., at 11, Chandos Street, Cavendish Square, London, W.1.

The Royal Medical Benevolent Fund Guild is overwhelmed with applications for coats and skirts for ladies and girls holding secretarial posts, and suits for working boys. The Guild appeals for second-hand clothes and household articles for the benefit of the widows and children who in happier times would not have needed assistance. The gifts should be sent to the Secretary of the Guild, 43, Bolsover Street, W.1.

England and Wales.

NEWCASTLE-UPON-TYNE AND NORTHERN COUNTIES MEDICAL SOCIETY.

THE annual address of the Society was delivered on December 7th by Sir Humphry Rolleston, President of the Royal College of Physicians of London. The President, Professor Stuart McDonald, occupied the chair. An audience of over two hundred listened with the greatest interest to Sir Humphry's "Reflections on high arterial blood pressure." The lecturer outlined the history of observations on blood pressure from the earliest records to the present time, and then passed on to a critical analysis of the causes and treatment of raised blood pressure. The address will be published in full in the journal of the Society. Professor Drummond proposed a hearty vote of thanks to Sir Humphry Rolleston, which was seconded by Dr. Andrew Smith and carried with acclamation. In the evening the annual dinner took place, at which Sir Humphry Rolleston was the principal guest; 130 members and guests were present. The health of "The Guest" was proposed by Professor T. Beattie, and Sir Humphry Rolleston replied. In his speech he referred to several famous medical men who had originated in the Newcastle district, including Akenside, Addison, and Snow. "The Society" was proposed by Professor Arthur Robinson, Vice-Chancellor of Durham University, and responded to by the President. Dr. R. A. Bolam proposed the health of the other guests of the Society—namely, Professor Drummond, Admiral Slayter, and Mr. S. Dunstan. Admiral Slayter replied.

THE GRADING OF MILK.

The Minister of Health has made an order entitled the Milk (Special Designations) Order, 1922, prescribing the conditions subject to which licences may be granted for the sale of milk as "Certified," "Grade A (tuberculin tested)," "Grade A," or "Pasteurized." The order comes into operation on January 1st, 1923, and copies may be obtained from the Stationery Office either directly or through any bookseller. The principal conditions laid down in the Order are as follows:

Certified milk must be produced from healthy cows which have passed the tuberculin test. It must be bottled on the farm, and must satisfy a somewhat severe bacteriological test.

Grade A (tuberculin tested) milk must be produced from healthy cows which have passed the tuberculin test. It must be bottled before distribution, and must satisfy a bacteriological test less severe than that required for certified milk.

Grade A milk must satisfy the same conditions as Grade A (tuberculin tested) milk, with the exception of the tuberculin test.

Pasteurized milk must have been held at a temperature of 145° to 150° F. for at least half an hour, and then cooled to 55°, and it must satisfy a prescribed bacteriological test.

The Order prescribes the fees payable for licences; these have been fixed at such amounts as are estimated to recoup the licensing authorities for their expenditure under the scheme, but the fees are open to revision in the light of experience. An amending Order, dated December 18th, has since been issued, relaxing for a period of six months so much of the principal Order as limits the use of the designation "Pasteurized" to milk which has been treated by the process specified in paragraph (1) of Part IV of the third schedule to that Order.

SMALL POX IN LONDON AND THE PROVINCES.

Confidence that the outbreak of small-pox in London had been overcome has been shaken by the occurrence of two fresh cases in Southwark on December 20th. At the beginning of the present week only 15 cases remained in hospital, and there had been no fresh admissions since November 24th. In an interesting report Dr. F. W. Alexander, M.O.H. Poplar, gives an account of the action taken in that borough. The outstanding fact is the vigour and concentration of effort devoted to the stamping out of the infection. The danger of the position was at once realized, and a wholesale immunization by vaccination of the inmates and staff of the Poplar workhouse was undertaken and overtaken without delay, so that only those who were already infected or whose infection was too far advanced to be forestalled by vaccination developed the disease. At the same time search for and surveillance of contacts was carried out. The Ministry of Health, the County Council, the borough health authority, and the guardians all shared in the crusade, and all have to be congratulated on the action taken. In the provinces the position is more doubtful. Cases are reported from Nottinghamshire and Jarrow, and also from South Wales. It will be important to know whether these cases are of the mild or American type which has been the general character of variola in recent years, and also in the present year, or whether the disease in any of the affected areas is of the severe strain, with its 30 per cent. of fatality which has been experienced in London. It is too soon to go into details of the Asylums Board's cases, but a provisional report by the Chairman of the Infectious Hospitals Committee states that from July 25th to December 6th 69 cases of small-pox were admitted. Of these, 23 had died and 15 remained under treatment. Of the cases admitted none showed evidence of vaccination or revaccination within the preceding seventeen years; 12 of the 21 cases with no evidence of vaccination at any period had died; whilst of 48 cases that had been vaccinated in infancy but not since only 11 had died.

Scotland.

CHAIR OF PUBLIC HEALTH IN GLASGOW.

MR. HENRY MECHAN, one of the leaders in industry in Glasgow, has presented a sum of £25,000 to the University of Glasgow, for the establishment and equipment of a chair of public health. Hitherto the two departments of forensic medicine and public health have been combined, but Dr. Glaister, the Regius Professor of these subjects, recently reported to the University Court that there had been an enormous increase in the work of the two departments. At the examination last September there were no fewer than 295 candidates. Professor Glaister went on to represent that the time had come when, in the interests of the University, the two subjects should be separated and that an appointment should be made exclusively to the department of public health, leaving him to devote himself to forensic medicine. It was no doubt in consequence of this representation that Mr. Mechan has made his munificent donation. He has left all the details to be settled by the University authorities. The Principal, Sir Donald MacAlister, in making the announcement to the University Court on December 14th, said that the necessary steps to obtain a new ordinance establishing the professorship would be taken immediately. At the same meeting of the Court it was announced that the sum of £20,000 bequeathed by Mr. William Gemmell for the foundation of a chair in the faculty of medicine or of science, in memory of his brother, the late Dr. Samson Gemmell, Regius Professor of the Practice of Medicine in the University, had been received. The Principal remarked that these two chairs raised the number founded in the past fifteen years to seventeen. Even during the last few months four chairs have been founded: physiological chemistry, bacteriology, organic chemistry, and applied physics. The *Glasgow Herald*, in commenting on the most recent gifts, says, speaking of Sir Donald MacAlister, "We shall not go wrong in assuming that his striking personality and high service to the University have some relation to these munificent gifts by the grateful and far-seeing sons of the city."

ST. ANDREWS UNIVERSITY AND DUNDEE ROYAL INFIRMARY.

At a meeting of the governors of Dundee Royal Infirmary on December 11th the announcement was made that a joint committee of the University Court of St. Andrews and of the Royal Infirmary governors had recommended, among other things, that in the event of a vacancy occurring in one of the professorships of medicine, surgery, pathology, or obstetrics the joint committee should recommend to the University Court one or more persons in order that the Court might appoint one of these to the vacant professorship, and the person so appointed should thereafter be elected to the staff of the Infirmary by the directors. It was also recommended that the joint committee should be retained as a standing committee, with the function of harmonizing the activities of the University and the Infirmary in matters common to both organizations. These recommendations had been approved by the directors and sanctioned by the University Court.

TREATMENT OF CRIMINALS.

The last meeting of the Glasgow Medical Lunch Club for the present year was held on December 14th. Dr. John Henderson occupied the chair, and Dr. James Devon, Prison Commissioner for Scotland, was present as the guest of the Club.

After lunch Dr. Devon addressed the members on the treatment of criminals. He began by stating that from the purely medical standpoint the first consideration is the welfare of the patient, that the primary duty is the saving of life, without regard to the possible value of the life saved. In the treatment of criminals this principle could not be carried out, as the safety of the public must be considered, and to ensure this a suitable line of action must be adopted towards the offender. The proper care of the criminal was a considerable expense to the country, appreciably greater in England than in Scotland, and any scheme of reform seemed only to result in increased financial outlay, without any corresponding certainty as to improvement. Dr. Devon quoted figures illustrative of the annual cost of upkeep for each inmate in a Borstal institution and in prison. He emphasized the fact that the first consideration should not be the comfort of the offender, but the safety and comfort of other people. The world could not be altered to suit the criminal, but the offender must be made to realize that, to remain a member of a community, he or she must conform to its rules. Various classes of offender were cited, and the lecturer emphasized the point that often the so-called political offender was a greater nuisance and danger to the community than those who commit crime under the influence of passion. The latter, after a term of punishment, were not likely to repeat the offence, but the former could not be trusted to refrain. He or she would not obey the laws of a community, whose constitution they were determined to alter by any means, regular or irregular. With regard to the education of the criminal while under restraint, the lecturer expressed his conviction that this should be directed along some line by which on his release the offender might be able to earn a living honestly. The sort of higher education which was attempted in some quarters was unnecessary, and in most cases futile. The address was much enjoyed by the large attendance of members present, whose thanks were expressed by Dr. D. McKail.

Central Midwives Board for Scotland.

At a special meeting of the Central Midwives Board for Scotland for the hearing of penal cases, when Dr. James Haig Ferguson was in the chair, the certificates of two midwives were directed to be cancelled and their names removed from the roll. In one instance judgement had been deferred for further reports from the local supervising authority; these were unfavourable. In the other case charges with regard to failure to take and record pulse and temperature, to keep a register of cases, to send for medical assistance in a case of emergency, and of being generally incapable of carrying out the rules were found to be proved. This woman was further prohibited from attending women in childbirth in any other capacity.

Ireland.

Belfast Teachers in America.

At a meeting of the Ulster Medical Society held in the Medical Institute, Belfast, on December 7th, with the President, Mr. R. J. Johnstone, in the chair, Mr. Andrew Fullerton read "Notes on a visit to hospitals in Canada and in the United States." His visit embraced Montreal, Toronto, Chicago, the Mayo Clinic of Rochester, Baltimore, New York, Boston, and Harvard University. Mr. Fullerton described the warm hospitality of both the Canadian and the United States surgeons, and the most pleasant reunions with those with whom he had worked in France. The essential points of difference between the American hospitals and those at home were the endless wealth that was showered by the rich in the former continent on their institutions; the readiness of both medical men and laymen to pick up, test, and, if found useful, adopt new ideas and suggestions, no matter from what source; the employment of large staffs of young ladies to keep indexes, records, and generally to facilitate looking up past histories and making references; the administration of anæsthetics by specially trained nurses instead of by medical men; the wonderful and very complete general organization; the provision of special pavilions for the middle classes in connexion with the general hospital, so that many surgeons practically spent their whole day at the institution, and the patient might have his own medical attendant, these patients having thus all the benefits at present conferred only on the poor or on the very rich in this country; the large amount of radium; and the sizes and completeness of the dental clinics. Mr. Fullerton gave very vivid and often humorous details of his interviews and adventures, and described the impressive ceremony of his admission as Honorary Fellow of the American College of Surgeons. He said, once more, that nothing could exceed the kindness and thoughtfulness of those whom he met, some of them complete strangers. The President proposed, and Professor Sinclair seconded, the following resolution, which was carried with acclamation:

"That the Ulster Medical Society congratulates Colonel A. Fullerton, C.B., C.M.G., on his election as an Honorary Fellow of the American College of Surgeons. Not only is this distinction a fitting recognition of Colonel Fullerton's eminence as a surgeon and of his wide fame as an urologist, but it reflects honour on the Belfast School of Surgery, of which he is so distinguished a member."

Professor MacIlwaine followed with his account of a "Holiday visit to Montreal, Toronto, and the Mayo Clinic." He described the charming site of the university at each of these Canadian cities, and spoke of the wealth at the disposal of American institutions. His chief interest lay in the pharmacological teaching of the student and in the research, and every step and all equipment were most kindly explained to him. The metabolic clinic with its special little hospital and its special kitchen was a great advance and its study very instructive. The various clinics at Rochester were described and his experiences in each. Everywhere he was struck with the immense amount of trouble taken and the immense amount of work. The indexing and reference staff of young ladies was most complete; in no other way could so much be got through. The kindness of everyone and the amount of trouble taken to show the visitor everything were beyond all praise. Dr. Dempsey and Dr. Gardner Robb spoke of their experiences in America; the latter said that the Rockefeller Institute sent him the anticerebrospinal serum free for the town. The President conveyed to both the readers the very hearty thanks of the meeting for their most interesting and instructive papers.

Typhus in County Mayo.

The typhus outbreak in the Barony of Erres on the West Mayo coast, about which alarming reports were circulated, is now well under control. When the first outbreak occurred in June the Public Health Department of the Irish Free State Government sent medical and nursing staffs with full equipment to the area. Since then there have been sporadic cases, but with the measures taken by the Public Health Department the serious danger which threatened the inhabitants is practically at an end; the number of deaths recorded is three. The two local medical officers were so unremitting in their attention to the patients that both were prostrated with fatigue and overwork, but neither contracted the fever. One of them has already resumed duty. Dr. McHale, the other medical officer, who was recuperating in Dublin, has returned to Belmullet, and it is expected that he will resume his duties in a few days.

Mr. Blythe, Minister of Local Government, in reply to a question, at a recent sitting of Dail Eireann, stated that in the middle of June cases of typhus fever were reported to the Minister of Local Government by the medical officers of health in Belmullet, and had continued at intervals over the intervening period. In all about 20 cases had come under notice, including the sanitary subofficer, who contracted the infection in the discharge of his duties, and one of the nursing sisters of the local hospital. The disease had been attributed to crowding in a disused coastguard station in which families who had deserted their homes took up their abode. Belmullet had long been recognized as a district in which typhus fever might be said to be endemic. The population was very poor, living in small and congested homes, with primitive habits, and the practice of housing animals in dwellings still existed. The normal disadvantages of the district had been aggravated by the unsettled conditions, and the sanitary administration was being carried out in the area under the gravest disadvantages. An inspector of the Ministry had reported on the immediate needs of the situation. A medical inspector had since been sent to the district and other action taken. The most recent information received by the Ministry was that there were no fever cases at present in the district, excepting two contacts in hospital under observation.

India.

RESEARCH IN MALARIA.

THE Indian Research Fund Association is instituting an investigation into the treatment of malaria, with the object of finding improved methods of coping with that disease. Major J. A. Sinton, V.C., I.M.S., has been placed on special duty for the purpose, and is to carry out his inquiries at Nagpur and Lahore.

AN IMPERIAL RESEARCH INSTITUTE FOR INDIA.

The Indian Legislative Assembly has approved of the proposal of the governing body of the Indian Research Fund Association to devote the capital fund at disposal to the erection of an Imperial Research Institute, and of the proposal of the governing body to devote two and a half lakhs of rupees to the purpose of the institute so long as they receive a sum of five lakhs from the Government. The offer of anonymous contributions, amounting to one and a half lakhs of rupees yearly for ten years, has been accepted towards the maintenance of a clinical unit based on the institute, provided that the Government of India, as funds permitted, would bring the total income of the institute up to five lakhs. The scheme has been promoted on the basis of a report by Professor Starling, and has been accepted by the finance committee. It is stated that the new institute is to be established in Delhi.

HOOKWORM INVESTIGATIONS IN INDIA.

Investigations into hookworm disease have been carried out by the Indian Research Fund Association in two selected tea gardens in Southern India by Dr. Mhaskar and Dr. J. F. Kendrick, the services of the latter being lent by the Rockefeller Foundation. It is stated that on an average 92.9 worms were found in each of the coolies examined on tea plantations. Thymol and beta-naphthol were employed in treating the disease, the latter being found to be the more effective as well as the cheaper. It is reported that while before the treatment was applied deaths on one of the estates from various forms of disease, including pneumonia, were very frequent—the effect of hookworm infestation being to set up a low standard of resistance to disease—after treatment an unprecedentedly clean bill of health was shown, attributable to the marked decrease in morbidity brought about by the elimination of the hookworm.

MATERNAL MORTALITY IN INDIA.

A discussion took place in the Indian Legislative Assembly on September 25th, on the proposal by Mr. Bakshi Sohan Lal, to refer to a select committee his bill for raising the age of consent in India to 14. Mr. B. C. Allen, a member from Assam, supported the bill strongly as a measure of social reform. He quoted Indian medical opinion as proof of the fact that the early marriage of Indian women was responsible for an appalling amount of infant mortality, maternal mortality, and female suffering. It was stated that the mortality of Indian mothers, so far as the imperfect statistics allowed an estimate to be made, was anything from 16 to 60 per thousand, which meant that in one generation three millions of mothers died in giving birth to children. The proposal to refer the bill to a select committee was rejected.

UNIVERSITY OF LUCKNOW.

The first Convocation of the University of Lucknow was held on October 30th, in the grounds of King George's Medical College. Among the graduates who were presented fourteen received the degrees of M.B., B.S., and five the Diploma in Public Health. Sir Harcourt Butler, Chancellor of the University, received the honorary degree of D.Litt., and, in addressing the assembly, congratulated the university authorities on the progress made since the foundation stone of the university was laid little more than eighteen months before. The university buildings, designed by Sir Edwin Lutyens, would, he believed, outshine all such buildings in India.

SCHOLARSHIPS FOR INDIAN MEDICAL WOMEN.

The Council of the Countess of Dufferin's Fund has decided to offer to Indian medical women scholarships for further study in the United Kingdom to the value of £200 per annum each. Applicants must satisfy the Council that they possess sufficient means to meet the passage money and additional expenses, which will amount at least to £150 per annum. All applicants must have had some general or hospital experience since qualifying. The present honorary secretary of the Countess of Dufferin's Fund is Lieut.-Colonel T. J. Carey Evans, I.M.S., Simla.

Correspondence.

INSULIN.

SIR,—Dr. Ff. Roberts introduces his letter on insulin, published in your issue of December 16th (p. 1193), by the statement that it is "perhaps not out of place to review the steps which have led up to the production of this new remedy." Dr. Roberts's "review" takes the form of a destructive and somewhat censorious criticism, and its publication by him appears to me to be "out of place" for more than one reason. It is, of course, the right and the duty of every scientific worker to sift the evidence presented to him on any subject, and to accept only conclusions which he finds well founded. So far as the public exercise of our critical function is concerned, most of us find ample scope for its activity in dealing with the work of others in the field of our own investigations, where destruction may be necessary to clear the ground for our own building. Armchair criticism is, I believe, in general "out of place." It seldom leads to anything but verbal controversy. The proper antidote to bad evidence is good evidence, and not judicial censure. I doubt the right, and cannot understand the desire, of anyone to assume the rôle of independent critic, unless he has private knowledge of facts, which convince him that the scientific world is being misled by fraud, or the innocent public by pretentious humbug.

Now Dr. Roberts's letter is not aimed at anything of that kind. He takes the simple, honest record of experiments, which are doubtless not free from defects, and denounces them as "wrongly conceived, wrongly conducted, and wrongly interpreted." Dr. Roberts has no knowledge of the circumstances in which the work was done, though he could easily have obtained such knowledge. If he had done so, his letter would probably not have been written. He did not know that the work he attacks was the first, unaided attempt at research by two young enthusiasts; that one spent half the war as a combatant, and the rest, after being seriously wounded, as a medical officer in England, while the other has not even yet completed his student course. He had no conception of the personal sacrifice and the heroic labour in which their enterprise involved them. Working thus on their own initiative, without the invaluable help and co-operation, given later by the head of the laboratory, who happened to be in Europe when the earlier work was done, they may have wandered along a wrong trail for a time, though this has yet to be proved. It may be that they made an unnecessary détour, before finding themselves at the point where E. L. Scott had stopped. The important point is that Scott did stop, and that Dr. Roberts would not be writing about his work now if Banting and Best and the other Toronto workers had not gone much further. I know that Dr. Scott would be the first to recognize this. It may be that the enthusiasm, which carried them further, was fired by an imperfect interpretation of their earlier results. If so, the mistake will be cleared up in time by others working more calmly and with more experience, and the truth will emerge.

There is nothing to prevent Dr. Roberts from putting his own theories to the test of experiment. Nobody can deny that a discovery of first-rate importance has been made, and, if it proves to have resulted from a stumble into the right road, where it crossed the course laid down by a faulty conception, surely the case is not unique in the history of science. The world could afford to exchange a whole library of criticism for one such productive blunder, and it is a poor thing to attempt belittlement of a great achievement by scornful exposure of errors in its inception.—I am, etc.,

H. H. DALE.

National Institute for Medical Research,
London, N.W., Dec. 18th.

TREATMENT OF FEVER.

SIR,—May I thank Surgeon Commander Bastian, Captain Gelston Atkins, and Dr. Buchanan for their letters?[1] With other medical men I am making immense claims for a line of treatment and research which is founded on a theory of recovery and immunity other than that generally accepted.

[1] BRITISH MEDICAL JOURNAL, December 2nd, p. 1097.

Very naturally and properly, medical men, with their unhappy experience of mare's nests, tend to be sceptical. With this difficulty in view, I appealed in my original communication[2] for independent evidence. The truth of a hypothesis is best demonstrated when it confers powers of prediction. We prophesied[3] that it is possible to reduce the severity of small-pox. Captain Gelston Atkins supplies unexpected and very welcome confirmation, though unfortunately in only one case. May we renew our appeal to such of our readers as have opportunities of treating this disease? Personally I am confident that it may be rendered little more dangerous than measles, or even chicken-pox.

That the treatment we suggest is not merely palliative is sufficiently demonstrated by the numerous febrile cases of unknown origin—disease aborted before recognizable—which are met when it is employed. The curious ring of retreating and diminishing inflammation seen in erysipelas is even more decisive. May I quote an instructive case?

A boy was admitted to hospital with cellulitis and apparently periostitis of the leg. Immediate operation was considered necessary; there was, however, unavoidable delay, so he was put under treatment with "triple powder" as a palliative measure, and the leg was prepared for operation. He was anaesthetized ten hours later and laid on the table. When the dressings were removed the surgeon declared that the wrong leg had been prepared. The other leg was normal. Complete recovery.

In this hospital one of the house-surgeons, founding his opinion on the fall of temperature, declared that the treatment produced great shock. I took him to see various persons who, delighted with repeated shocks, were doing very well. A mile or so distant is another hospital where the treatment had "no effect," which I daresay was true in a sense. Two miles distant was yet another where the treatment has had so much effect that it has become the routine.

The treatment is not empirical. As indicated by Commander Bastian, it is founded on the belief that the human being, physically and mentally the educable animal, may be trained to tolerate many (not all) poisons; that recovery and immunity from acute disease imply this habituation; that habituation is more easily and safely attained by a succession of small doses than by the huge continuous dose which is experienced in disease; that toxins are eliminated in the sweat (hence the improvement in the crisis of pneumonia, the cool stage of malaria, and the moist skin which commonly accompanies recovery from most fevers); that toxins tend to paralyse the sweat centre, and so, by bottling themselves up, to place the intrusive bacteria in a position of advantage; that it is possible by means of this treatment to restore the centre to action, and thus produce a series of artificial crises which enables the sufferer to experience a number of small doses with intervals between, whereby opportunity is afforded for his cells to attack and destroy the bacteria and attenuate their toxins. A scale of toxins, attenuated in varying degrees, is thus produced, and recovery and immunity are achieved by reacting up this scale. In vaccination against small-pox attenuated toxin is provided by passing the virus through the calf; in rabies by drying the cords of infected rabbits; in diphtheria by digestion in the tissues of the horse; in snake poisoning by gastric digestion antecedent to snake bite, and so on. Presumably an antitoxic serum provides attenuated toxins together with the enzymes which digested them. Vaccination provides bacteria which themselves provide attenuated toxins. Presumably, also, the enzymes are the same in all diseases, but the toxins and therefore the habituations to them are specific.

This theory of habituation, though published as long ago as 1897,[4] has never achieved popularity among medical men, who have preferred to believe in specific antitoxins and antibodies—complex chemical substances which in some way neutralize those other complex chemicals, the toxins. Probably there are some thousands of animal and vegetable poisons (including the bacterial toxins) against each of which may be acquired powers of resistance that do not avail against any other poison. In other words, the human body is supposed to be a sort of magic bottle which is able, at short notice, to produce any one of an endless number of chemicals which counteract other chemicals of which, in many cases, the race has had no antecedent experience. Biologically speaking, we have here a supposition founded not on solid science but on miracle. We know that the human being is educable. By means of his educability we can explain much—for example, increased powers of resisting fatigue, poisons, and the like. The theory of neutralization goes farther—it explains educability on what seems to me an impossible chemical basis. However, this by the way; habituation there is, no matter what the machinery. Meanwhile, may I remind your readers that we cannot hope to establish the truth about this treatment unless there be publication of results? May I also suggest its trial in the case of snake bites, insect stings, and perhaps other forms of poisoning?—I am, etc.,

Southsea, Dec. 6th. G. ARCHDALL REID.

[2] BRITISH MEDICAL JOURNAL, June 4th, 1921.
[3] Ibid., November 18th, 1922, p. 1000.
[4] *Lancet*, September 11th.

SIR,—I notice with much interest that several medical men have recently made the discovery that diaphoretics are of great service in the early stages of febrile disorders; the further interesting observation that a purge, such as calomel gr. iv, may also be usefully employed is, if possible, even more epoch-making.

It seems strange that our predecessors never thought of these measures, but they of course had not the exact and intimate knowledge of toxins and their nature and composition that we have, though they did have, I believe, some vague notion of purifying the blood.—I am, etc.,

December 3rd. W. B.

X RAYS IN HYPERTRICHOSIS OF THE FACE.

SIR,—I have read Dr. Semon's courteous rejoinder to my criticism of his previous letter. I have unfortunately had a long and close contact with the dangerous side of *x* ray therapy, and have seen every class of case from an *x* ray burn to a chronic *x*-ray dermatitis. (His case was the latter, not the former.) It is therefore with a full sense of responsibility that I express the opinion that the matter is still one for careful research and careful feeling of the way. We all, of course, know that developmentally and anatomically the root bulb of a hair follicle and the rete Malpighii are closely related and pass insensibly one into the other. But is it not begging the question to assume that they are therefore equally sensitive to irradiation? Many different tissues in the body are of epiblastic origin, and yet vary largely in their reaction to *x* rays. Do we not get frequent illustrations of the greater susceptibility of the Malpighian contents of the hair follicles than of the rete Malpighii itself? In alopecia Celsi we have at times complete atrophy of the hair follicles with comparatively few changes in the skin itself. I have under my care at the present moment a girl of about 14 suffering from universal alopecia of eight years' standing but with no apparent atrophy of the epidermis itself. In symptomatic and senile alopecia have we not evidence of the great sensitiveness of the hair follicles? Dr. Semon "finds it particularly hard to give credence" to some of *my* statements. Dr. Thurstan Holland (*Archives of Radiology and Electro-therapy*, p. 203, December, 1920) records a case of hypertrichosis treated by *x* rays, which was a tremendous and complete success. The hairs fell out and did not grow again; no unfortunate after-effects occurred. As I stated before, Dr. Holland now refuses to treat such cases. But the fact remains that he had *one* success. If possible *once* it must be possible again. I know it is taking great risks, but to progress risks must be taken. A suitable technique may yet be found. Do not other medical men take risks? How many surgical methods have begun in disaster and ended in success? It is unfortunately the fact that when a radiologist makes an error of judgement all the world can see it and recognize it. It is not always so in other walks of medical science. Dr. Semon accuses me of "discrepancy" and "inconsistency." I am sure if he will read my letter again he will find neither.—I am, etc.,

Bradford, Dec. 10th. WILLIAM MITCHELL.

SMALL-POX AND VACCINATION.

SIR,—Of course I agree with Dr. C. S. Thomson that cases of unmodified small-pox may walk about—for a time. I can match the case he quotes from Dr. McVail by one which occurred in my own experience in Leicester. A tramp dangerously ill and with the eruption out visited a public-house three days before he died. His condition at once aroused suspicion, we were communicated with, and fortunately no further cases arose. Another case was "spotted" walking down one of our main thoroughfares, "rounded up," and brought to the Health Department. In my experience cases of this description which are soon recognized are less potent

for mischief than modified cases which are entirely overlooked until secondary cases occur.

Dr. Thomson goes on to say: "If Dr. Millard's suggestion were followed [that is, the abandonment of compulsory infantile vaccination], then we would witness a repetition of the Gloucester disaster wherever small-pox commenced." This is begging the whole question. It is just because I think there is insufficient justification for this assertion that I have ventured to challenge the orthodox teaching about infant vaccination. (I can assure Dr. Thomson that to do this is not the "easy" or "popular" thing which he suggests, though possibly it is less difficult for me than for most health officers. Of all medical heresies, heresy on the subject of vaccination is surely the most heinous!) Anyone who studies the Gloucester epidemic in an unbiased spirit must admit that there were ample reasons, apart altogether from the neglect of infant vaccination, to account for the débâcle which there ensued. The whole handling of the epidemic, from an administrative point of view (I am not blaming the unfortunate officials) was a glaring example of how not to control small-pox. Such an occurrence ought not to happen again, and, as a matter of fact, has never happened since, although a quarter of a century has elapsed. During this time our methods of controlling small-pox have greatly improved, and, although the disease has been repeatedly introduced into the country, it appears to be finding increasing difficulty in gaining a foothold, in spite of the fact that infant vaccination is falling more and more into disuse. Small-pox has now become one of the rarest of our zymotic diseases, and for the past decade the mortality caused by it has been almost negligible, in spite of the large proportion of children which is unvaccinated.

Moreover, as a set-off against Gloucester, we must remember that even the best vaccinated towns, such as Warrington and Middlesbrough, have had very serious and very fatal epidemics, though it is not the fashion to talk much about them. In Middlesbrough, in 1897, where the M.O.H. estimated the proportion of unvaccinated at only 2 per cent., over 1,400 cases occurred, and 108 vaccinated persons lost their lives. Of course, in every epidemic the case mortality is higher amongst the unvaccinated, but this is no evidence of the efficacy of infant vaccination in keeping small-pox at bay, though many people argue as if it were so.

Dr. Thomson asks what I should answer to bereaved Leicester fathers whose children might lose their lives "through taking my advice," should the long prophesied conflagration occur. I do not wish to seem to disclaim responsibility, but let me say that I have never advised parents not to have their children vaccinated. I quite admit, however, that I have not attempted to tell them that they are exposing their children to grave risk by not having them vaccinated, because I do not believe that they are. Let me say further that if the people of Leicester follow my advice, should the need for vaccination ever really arise, there need never be a serious conflagration in Leicester at all comparable with what happened in Gloucester or Middlesbrough. I quite recognize that it is conceivable that the time may arise when I shall find it my duty to advise universal vaccination of the entire population. The only real difficulty in the way of such a step is the unfortunate prejudice against vaccination (largely engendered by compulsory infant vaccination), and I contend that I have done more to allay this prejudice by my moderate attitude towards vaccination than if I had been an ardent provaccinist like Dr. Thomson. Moreover, I flatter myself that should a real need for universal vaccination ever arise the people of Leicester will be all the more ready to follow my advice just because I have never cried "wolf" when there has been no wolf. The people of Leicester know full well not only that I am not an antivaccinist but that I have a profound faith in the efficacy of recent vaccination. I gave them tangible proof of this by taking my wife and young family, recently vaccinated, to visit the patients in our small-pox hospital and photographing them by the bedside.

Dr. Thomson says that not one medical man in a thousand shares my views. It may be so; I cannot say; though I would suggest the possibility of there being more prophets in Israel than he suspects. I can say, however, that in 1915 the State of New York, acting on the advice of their health officer, Dr. Herman Biggs, virtually abolished compulsory vaccination by repealing the regulation under which all children had to produce evidence of vaccination before being admitted to school. Dr. Herman Biggs, who is one of the most experienced and distinguished members of the Public Health Service in the States, gave this advice, I understand, because he had come to believe that the disadvantages, in the way of injury to health caused by child vaccination, more than outweighed the advantages to be gained by immunization against a rare disease like small-pox.—I am, etc.,

Leicester, Dec. 16th. C. KILLICK MILLARD.

PSYCHO-ANALYSIS.

SIR,—I note that there are still some in our profession who remain out of sympathy with the psychological theory of mental disorder. Further, these gentlemen attempt by argument in your pages to overcome what they consider the foolishness of the adherents of this theory. But what, put into plain English, is the great psychological discovery of our day? Simply that most cases of mental disorder are cases of extreme foolishness. Adherents of the physiological theory of mind are, then, themselves psychotherapists without knowing it. They do not attempt to prove their point by the application of physiological or anatomical methods to their opponents' skulls—experience proves that there is a better way, namely, by argument, rhetoric, and so forth. Well, so also with the extremer degrees of mental perturbation which are known as insanity. Whether or not this method be "scientific" depends on the meaning we attach to such words. The main point is, it works.—I am, etc.,

Edinburgh, Dec. 16th. A. J. BROCK.

SIR,—The correspondence upon this topic has at last focused upon a definite issue. Does the psychological interpretation of mental disease involve the denial of its physical basis? Sir Clifford Allbutt (to whose address to St. George's Hospital this narrowing of issues, I think, is due) has assumed that it does, and along with his followers has concluded that scientific psychiatry must be "physiological." On both points they are wrong.

In its most general statement the method of psychopathology is to seek the explanation of certain behaviour (abnormal) in the special circumstances of the patient's life history. It aims at a direct correlation between types of upbringing and types of reaction. Of course "cerebral dispositions" are the link between the two; psychology does not, and has no need to, question their existence. But it holds:

1. That these abnormalities are not necessarily determined by toxins, lesions, or germinal variations affecting (directly or "externally") the integrity of the nerve tissue, but may be due to unusual patterns, sequences, intensities, etc., of the afferent (formative) stimuli. If this should be so, the methods of general pathology are inapplicable.
2. That in any case a physico-chemical formulation of the neural substrate of thought is at present unattainable. Wild conjectures such as Dr. Berry mistakes for facts ("remember that dreams are merely impulses," etc.) are, from the psychological as from the practical point of view, worse than worthless.

Dealing with this second point first, it is surely obvious that the "engrams," "dispositions," etc., are known wholly through the behaviour, memories, etc., they occasion. We do not increase or improve this knowledge by adulterating it with physiological imagery. On this point the physiological school of psychiatry is at variance with behaviourists and psychologists alike. These latter schools differ as to the necesssity of "subjective interpretations," but this is a different question and cannot be discussed here. Both agree in correlating conduct and speech-reaction (memory) with each other and directly with the life history of the organism, without interpolating detailed physiological hypotheses. In thus dispensing with physiological explanations, it must be noticed that it is their adequacy and not their possibility that is challenged, and moreover that we are not forced back upon "subjective interpretations" as the sole alternative. Sir Clifford Allbutt and his followers are wrong, therefore, in supposing that psychopathology implies an animistic denial of the physical basis of thought, and also in claiming for physiological psychiatry the monopoly of objective method.

Space does not permit me to "counter-attack" the neuropathologists' position or to show how so gross and widespread a misunderstanding arose. Apart, however, from all their positive errors, they have confused the animist, psychological, and behaviourist positions, and the issues that divide these schools—so much for their knowledge of what they criticize! They have assumed that the denial of a pathological basis is tantamount to a denial of the existence of a physical basis—so much for their logic and "thoroughness." They quote

extensively (at least Dr. Berry does) from popular drivel. This reflects either upon their sincerity or upon their learning.—I am, etc.,

Perth, Dec. 12th. IAN D. SUTTIE.

SIR,—Would it not be as well to ask ourselves what the word "psychology" means? If it has a meaning it would appear to be "the study of the psyche," and we can amuse ourselves finding varying translations for the Greek ψυχή. One fact would seem fairly clear, that it cannot by hook or crook be adequately translated by any physiological term. This being the case, I suppose a psychologist, being a person who studies the psyche, has no part in medicine, which studies physiology. "If we believe the dictum of Cabanis that 'nerves make the man,' we have no real necessity of making the vastly difficult postulate that a human psychology exists," writes Dr. Maurice Nicoll. Further, if we do hold this theory we should obviously not call ourselves psychologists nor profess the study of a subject we consider a myth. Further still, we had better hold aloof altogether from the "wanderings" of those deluded unfortunates who believe in such a phantom.

But surely the proof of the pudding is still in the eating? I have not yet found it any help to a psychopath haunted by nocturnal dream-terrors to know that "dreams are merely afferent impulses from enteroceptive, proprioceptive, and exteroceptive sources running riot amongst the cells of a brain where control has been removed by sleep . . . ," but I have found amazing and speedy relief follow treatment based on the belief in a hypothetical psyche.

As a matter of fact, the neurological pronouncement I have quoted is just as hypothetical; no one has seen it happen, and neurologists are by no means in accord on the matter. It seems possible, in view of the experimental data, is about the best we can say. It is merely the present neurological theory, which, like all theories, is, in its day, the only correct one. I would not be understood to represent the psychological theory as correct; it probably is not. But it works, and when I can find another to work better I will gladly give it up. I am prepared to believe that neurology can tell us how we dream, by what mechanism the effect is produced, but to the "Why?" neurology gives no satisfactory answer. If Dr. R. J. A. Berry had not "suspected" a meaning in day-dreams, though doubtless understanding their mechanism, one would expect him to rejoice at hearing a theory which offered an explanation of what must have been an otherwise irritatingly meaningless phenomenon.

However, I quote Nicoll again: "By insisting on a human neurology we can thus, at first sight, prevent the existence of a human psychology. This is the attitude of many physicians at the moment." And, it would seem, *mirabile dictu*, of not a few professors and teachers of psychology.—I am, etc.,

Netley, Dec. 16th. JOHN A. TIPPET, M.R.C.S.

HOSPITAL POLICY: THE REPORT OF THE COUNCIL.

SIR,—The letter of Dr. Garratt, dated December 2nd (p. 1196), shows a great advance upon the previous attitude taken up by him. At last he declares freely and frankly that the Leicester resolution is "entirely suitable" for hospitals in the great industrial areas. That is an immense concession on his part. Once controversialists can see the other side there is reasonable hope of an acceptable accommodation.

Dr. Garratt's reading of the history of the Leicester resolution is less happy. That resolution was fairly and fully discussed at hospital staff conferences, at Divisional meetings, and at the Annual Representative Meeting, 1921. The case presented by the hospital staffs from the industrial areas was so strong that it carried conviction and secured the acceptance of that resolution. Later those whose lines are fallen to them in pleasant places began to reflect on the possible reaction of the resolution on their own practice, and the reaction of their fears was seen in the Annual Representative Meeting at Glasgow. They secured the rejection of an amendment to the Leicester resolution, but dared not push the attack to the length of attempting its repeal. Following Glasgow, the Council has considered the situation in all its bearings, and has put forward an amendment to the Leicester resolution which forms a bridge that can be used with comfort and safety by both parties, and I am hopeful the amendment will receive the blessing and whole-hearted support of Dr. Garratt.

I would urge all interested in hospital work to read the report of the Council which was published in the SUPPLEMENT of November 18th, 1922 (p. *186*); it gives the terms of the new resolution and a short explanatory statement. So far as I can hear, the report is being received with a remarkable degree of unanimity.—I am, etc.,

London, W., Dec. 16th. N. BISHOP HARMAN.

DIPHTHERIA PROPHYLACTIC AND IMMUNITY.

SIR,—Nurse H. is one of two nurses among those on duty in the diphtheria wards of Tolworth Isolation Hospital who were positive to the Schick test in June, 1922. She was given three doses, 1 c.cm. in each, of diphtheria prophylactic (toxin-antitoxin mixture), the last of the three on July 11th. On November 18th she complained of sore throat and had a temperature of 101° F.; the left tonsil was enlarged and capped by a patch of white exudation about the size of a threepenny piece which was easily wiped off; a swab from the throat, on culture, showed a growth of Klebs-Loeffler bacilli and micrococci. On November 21st she felt quite well and on November 23rd the tonsil was clean; cultures from the throat continued positive on November 23rd and 26th but were negative on December 1st.

If this attack was diphtheria it would tend to awaken some distrust of the efficacy of prophylactic inoculations, for the patient was one of two nurses who had received the inoculations four months previously; in other words, 50 per cent. failure, a very different result to that shown by some American figures, according to which 95 per cent. of 201 children who had had three prophylactic inoculations were immune three months afterwards. I think, however, that there is another possible explanation of her attack.

She may have been a "carrier" (so far as I know prophylactic inoculations do not prevent this); nurses in the diphtheria wards have not infrequently been found to be "carriers" when, prior to any one of them being transferred to the scarlet fever wards, a swab from the throat has been examined; and while being a "carrier" she may have contracted a mild sore throat with a follicular exudation due to some other organism. This was the view I took; but if she had not previously had the prophylactic inoculations I should certainly have labelled her attack mild diphtheria.—I am, etc.,

Surbiton, Dec. 5th. HARRY COOPER, M.D.Oxon.

EXPERT WITNESSES: SURGICAL AND MEDICAL.

[IN our issue of September 16th (p. 531) we published a letter from Mr. C. H. Fagge, in the course of which he criticized the method in which, in the courts, medical evidence is called for the plaintiff *and* for the defendant, and urged that it should be discontinued. This drew from Sir John Lynn-Thomas a letter, published on September 30th (p. 614), in which he described the course of action he came to adopt when asked to give expert evidence. He consented to see the patient, took full notes of the case, and when his examination was finished said: "I will send a copy of the notes I have taken to your doctor, and will ask him to come and discuss your case with me, so that I shall have full inside knowledge before deciding whether I can support your claim." From the next sentence of his letter we gather that after he took this course he was not very frequently invited to act as a medical expert witness. Shortly afterwards Sir Clifford Allbutt addressed a letter to Sir John Lynn-Thomas, and has now been kind enough to consent to its publication. It is as follows:]

St. Radegund's, Cambridge,
November 24th, 1922.

DEAR SIR JOHN,

In my early days in Leeds these cases were very many; then there were few of the modern developments for the security of railway passengers; also more sources of lead poisoning, etc., etc. In Leeds the profession was not infected by any spirit of jealousy; we were all brothers—and I think, there, things are still on this co-operative footing. Due to the concentration of hospital work all in one large institution? So we soon gained a reputation for fairness as medical witnesses. But you ask for more than this:—We soon felt a grave objection to setting medical men as fighting-cocks one against another; it led to some partisanship if not direct advocacy; and to unbecoming differences of statement—even as to facts. So we held a meeting, and decided that we would combine to refuse to give evidence in legal cases unless a consultation of both sides were arranged before the case came on in court; even if this were—as often it was—very shortly before. Many witnesses came from a distance, and

so on. I do not say that these consultations put an end to all differences between experts on the two sides, but many of these were apparent rather than real, and mostly cleared up by consultation. In the witness-box we often differed in opinion, but not much on the facts. Moreover, our differences were clean cut and intelligible to the court.

We met at first with bitter opposition from the lawyers—open from the solicitors, covert from the Bar, because it tended to cut down fees, or to show less for them! Moreover, they naturally feared our making pies of our own—that we might be too compromising, etc. But some of the larger legal firms approved our ruling, and even applauded it; so did gradually the leading counsel. The amendment became apparent to all, and ere long we had all cordially with us. The evidence was immensely improved in both quality and consistency; new facts or new interpretations came out; and doctors of less experience were not sorry to accept a more adequate diagnosis, or partial modifications. I will give an instance: A consultation was arranged between two of us and a doctor from a distance in a case of railway injury—the top of shoulder bruise which you know so well. Unfortunately the patient's doctor missed his train and didn't appear at the consultation. He was a very honest fellow, and had assured the patient that his complaints were due to transitory if not imaginary causes. We "experts" examined him just before the court sat—and found under some fat layers (electric tests, etc.) decided atrophy of the right shoulder girdle. With us was an expert for the patient, and he quite agreed. The case proceeded, and the patient's doctor came in, hot from his journey, and rather gave his patient away of course. Then the counsel for the railway company arose and explained to the judge that, on the contrary, the railway company was prepared to accept the patient's story, and to give referee's damages. Then said the judge: During the lunch interval I walked to the window of my room with a sandwich and glass of sherry and saw the plaintiff walk out with his wife, also to lunch. I saw him put up his umbrella under his right arm; it fell to the ground. He picked it up again, and again it fell to the ground. Then his wife picked it up, and he put it under the other arm, successfully. Now if the case had gone forward I intended to set this evidence of mine against the "transitory neurosis," and I should have summed up against you. He then complimented the railway people on their correct attitude.

Well, in this sort of way we got credit, so that from the vulgar point of view we made even more fees; people trusted us, and cases came (when possible) to the Leeds Assizes. It was before this little story that Fitzjames Stephen had paid a formal compliment to the Leeds medical evidence. He said from the Bench how different was the Leeds evidence to that of too many other places, and he could not speak too highly of the temper and consistency of the Leeds evidence. He had attended the Leeds Assizes rather frequently. I may add that the official medical officers of the railway company were included in our *both sides* consultation rule always, and although one or two of them were disposed to take very sceptical views of all their cases, yet they took a loyal part in the discussions.

Very sincerely yours,
(Signed) CLIFFORD ALLBUTT.

[The observations by Mr. Justice Stephen to which Sir Clifford Allbutt refers were noticed in a paragraph published in our issue of August 28th, 1880 (p. 354), as follows:

MR. JUSTICE STEPHEN AND THE LEADERS OF THE MEDICAL PROFESSION IN LEEDS.

DR. CLIFFORD ALLBUTT (Leeds) and Mr. W. A. Statter (Wakefield) gave evidence, at Leeds Assizes, before Mr. Justice Stephen, relative to the injuries which a young lady had received in a railway accident on the Lancashire and Yorkshire Railway. At the close of the case, says the *Yorkshire Post*, his lordship paid a very high compliment to those gentlemen, and to the leaders of the medical profession in Leeds generally. He said the medical evidence by Mr. Statter and Dr. Clifford Allbutt was a pattern of what such evidence should be. He was in the habit of hearing medical evidence in all parts of the country, and Leeds was the only town where he never heard those unseemly disputes between the legal and medical professions which occurred at other places. Here there was a certain number of gentlemen, the leaders of the medical profession in the great School of Medicine in Leeds, who had set an admirable example for many years past of truth and candour and straightforwardness in the witness-box, and he was happy to see that their example was being followed by the younger members of the profession. When a man really tried to tell the truth, the whole truth, and nothing but the truth, in plain and simple language, notwithstanding what consequences might be drawn from it, and whether he was called on the one side or the other, bullying in court and things of that kind ceased at once. Alluding to Mr. C. G. Wheelhouse, surgeon, of Leeds, who had seen the plaintiff on behalf of the company, his lordship said that although there was another eminent gentleman present to give evidence, the defendants had not found it necessary to call him. He hope that such a state of things might long continue in Leeds, and be imitated in other towns.]

Universities and Colleges.

UNIVERSITY OF OXFORD.

THE following candidates have been approved at the final examinations for medical degrees:

Forensic Medicine and Public Health: R. V. Facey, R. F. Johnstone, T. L. Ormerod, J. P. Shaw, A. L. B. Stevens, E. H. Watkins, A. Q. Wells, Norah E. Bodkin, Dorothy D. Crook, Sibyl R. Eastwood, Katharine M. Hodgkinson. *Medicine, Surgery, and Midwifery:* W. R. Brain, E. Chapman, D. S. Davies, H. A. Gilkes, J. G. Johnstone, C. R. Lane, Dorothy J. Collier, Katharine M. Hodgkinson, Constance M. Ottley. *Materia Medica and Pharmacology:* C. E. Beveridge, W. B. Boon, C. W. Carter, D. R. Gawler, L. N. Jackson, T. L. Ormerod, H. A. Robertson, B. E. Thompson, G. I. Wilson, G. P. Wright, Olive Buckley, Matilda Bergnion, Ella Cockran, Cicely Williams. *Pathology:* D. T. Barnes, A. M. Cooke, H. N. Elphick, P. H. Martin, G. F. Mitcheson, A. A. F. Peel, H. A. Robertson, A. W. L. Row, T. E. Ryves, B. G. Scholefield, A. L. B. Stevens, E. B. Strauss, T. S. Townsend, H. F. Turney, W. R. Wood, Alice E. Harding, Cicely Williams.

At a congregation held on December 16th the following medical degrees were conferred:

D.M.—W. Burridge.
B.M.—H. A. Gilkes, R. F. Johnstone, W. R. Brain, C. W. C. Bain, J. G. Johnstone. *Women:* D. W. Crook, K. M. Hodgkinson, D. J. Collier, C. M. Ottley.

UNIVERSITY OF LIVERPOOL.

THE following candidates have been approved at the examinations indicated:

FINAL M.B., CH.B.—*Part I:* B. E. Acland, Grace A. Au tin, †C. B. Bamford, R. V. Berrington, C. H. Bradley, R. S. Brock, Helen S. H. Brown, Alison M Brummitt, M. Byala, A. Cooke, J. W. Cohen, J. D Craig, M. M. Datnow, Edwina M. Davies, Eileen N Deane, W. T. Donovan, J. C. Drummond, H. Duff, H. W. Fell, H. R. Fisher, G. A Fu ton, J. Gaughan, Clara M. V. Gleave, H. Gobie, T. A. Griffiths, D. C. G. Hanlon, Dorothy M. Hanson, Fannie S. Holt, J. E. Howie, G. P. Huws, C. P. Jones, R. Jones, A. L. Kerr, G. F. Kinder, J. Leggate, W. E. Lishman, J. H. M. Little, G. Lowe, G. Macdonald, Margaret S. Macdonald, D. D. O. McLoughlin, G. A. Moulden, A. Newton, J. R. R. Nicholson, W. E. Pennington, A. Pool, R. J. Prydderch, Gwendolen ff. Roberts, J. T. C. Roberts, E. Rowlands, E. Scott, C. Sharp, G. V. L. Taylor, Marjorie A. Unsworth, N. Weinberg, H. S. Welton, T. W. White, Gwennie Williams. *Part II:* Mary G. B. Allen, W. J. B. Chidlow, A. Cooke, L. Davies, Kathleen Edgecombe, W. R. H. Ellis, E. J. Fairley, N. D. Fraser, S. C. Goldstone, H. Graf, W. J. Griffiths, A. J. Hawe, D. Kippax, D. D. O. McLoughlin, Phyllis Marsh, Margaret D. T. Mills, Dorothea W. Rogers, P. J. Rogers, J. F. D. Shrewsbury, Helen Standring, Mabel J. Watterson. *Part III:* Eleanor E. Briant, D. Frown, G. Clark, Marie B. Clarke, H. M. Cohen, R. L. Corlett, R. W. Cowie, *W. H. A. Dodd, J. Elsohn, W. C. Evans, F. S. Fowweather, H. S. Gordon, S. B. Hall, G. M. Hughes, Hilda F. Jefferson, I. Lloyd, Vera M. Mitchell, Annie R. Niven, Mary E. Nosworthy, J. R. Parry, G. F. G. Prideaux, C. C. L. Spurring, V. T. Thierens, Mary A. Thomas, L. F. Unsworth, A. Weisberg, D. A. Woodeson.

D.T.M.—M. J. Cohen, A. C. Crawford, C. M. Gracias, W. A. Lethem, M.C., S. D. Rieley.

* Distinction in Surgery. † Distinction in Pathology.

UNIVERSITY OF EDINBURGH.

A GRADUATION ceremony was held on December 15th in the McEwan Hall, Edinburgh, under the presidency of the Principal, Sir Alfred Ewing. The following were among the degrees conferred:

M.D.—D. Aiken, J. Brander, *De Puiy Casalis, ‡J. H. Crawford, *B. V. Dunn, J. D. Ingram, J. Mackenzie, †D. M. Morison, T. C. St. C. Morton, H. J. Parish, *G. S. Sowden, *J. Walker, L. H. Werden.

M.B., CH.B.—M. S. Abaza, S. C. Alcock, Isabella H. Allan, W. Anderson, Jean Y. Andrew, Margaret S. R. Armstrong, M. P. Atkinson, C. J. Austin, L. C. L. Averill, P. J. Badenhorst, J. B. S. Baxter, Lilias F. E. Begg, Margaret I. Bower, J. Brown, Eleanor M. Cadman, A. H. Campbell, J. M'P. Campbell, Mary J. Chene, ‖D. S. Cherry, Irene V. E. Christison, J. J. Coulthard, R. T. Deas, K. S. Dick, ‖J. L. N. Dinwiddie, Grace M. F. Dover, Grace W. W. Eason, E. C. Ellis, D. L. Ferguson, N. Fram, J. Glover, R. T. F. Grace, Annie C. S. Haddow, H. R. Haigh, Margaret M. R. Hamilton, H. Hastings, H. D. Hayes, Flora M. Hogg, C. F. W. Illingworth, A. K. James, L. B. Jones, Margaret W. Kemp, G. G. King, B. Leader, R. C. Little, Elizabeth T. Logan, D. B. M'C. Lothian, D. T. M'Ainsh, ‖I. H. M'Clure, F. N. M'Farlane, Annabella M'Garrity, J. C. Macgown, Elizabeth M. Mackay, A. W. Mackie, W. M'Kie, Marjorie C. Mackintosh, I. F. Macleod, R. A. C. Macnair, J. M. Manson, Grace J. Marshall, K. A. T. Martin, F. G. J. Mu der, C. L. L. Murray, S. Petkoon, Johanna V. Pietersen, Elsie Porter, Jean S. Riach, T. Ritchie, S. J. Rom, Isobel S. Rutherford, R. M'G. Saunders, Annie B. A. Scott, R. Selby, D. Slight, Flora M. Stewart, D. Summerville, B. G. Thompson, Charlotte E. W. Thompson, Elizabeth N. Thompson, H. V. Thwaites, ‖J. Todd, Isabella du Toit, H. R. Vernon, H. L. Wallace, R. W. R. Watson, Hazel H. F. Watt, J. Williams, Margaret S. Williamson, R. P. Wilson, M. Witkin, W. S. Woodburn.

The Freeland Barbour Fellowship has been awarded to Jessie Eeles, M.B., Ch.B.

* Commended for Thesis.
† Highly commended for Thesis.
‡ Awarded Go d Medal for Thesis.
‖ With Second Class Honours.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AN ordinary Council was held on December 14th, when Sir Anthony Bowlby, President, was in the chair.

Diplomas of Fellowship were granted to the following twenty-three candidates found qualified at the recent examination:

A. Goodwin, N. P. L. Lumb, C. L. Gimblett, J. L. Davies, J. F. H. Stallman, A. C. Ainsley, S. D. Lodge, R. S. Woods, A. C. Halliwell, C. O. Davies, L. C. E. Lindon, V. Wilkinson, H. L. Sackett, *Mildred Warde, A. D. Wright, R. B. Chandrachud, R. A. H. Fulton, I. B. Jose, N. J. Judah, G. C. Wellish, J. G. Whitaker, H. P. W. White, D. Whyte.

* Under the Medical Act, 1876.

A further candidate was found qualified, but has not yet complied with the regulations.

Dental Surgery.—Diplomas in Dental Surgery have been granted to eighty-four candidates found qualified at the recent examination.

A report from the examiners in dental surgery was received. Certain new regulations were adopted, which apply to all candidates who pass the preliminary examination in general education on or after January 1st, 1923. Information may be obtained from Mr. F. G. Hallett, O.B.E., Examination Hall, Queen Square, Bloomsbury, London, W.C.1.

Delivery of Lectures.—Owing to Sir Arthur Keith's illness, his lectures, arranged for January, 1923, have been postponed to March or later.

LONDON SCHOOL OF TROPICAL MEDICINE.

THE following students have passed the examination of this school held at the termination of the seventieth session (September to December, 1922):

*†Major T. L. Bomford (I.M.S.), *Dr. W. T. Benson, *Captain G. Covell (I.M.S.), *Lieut.-Colonel W. H. Hamilton (I.M.S.), Miss B. Richardson, Miss H. Gregory, C. J. H. Sharp, Squadron Leader H. A. Hewat (R.A.F.), C. J. Pandit, Captain H. Chand (I.M.S.), W. G. Karandikar, K. Nain, F. W. O'Connor, W. P. H. Lightbody, Major M. J. Holgate (I.M.S.), Captain P. R. Vakil (I.M.S.), B. C. Dasgupta, C. A. Calder, H. T. Le Vieux, J. Cauchi, J. M. Surveyor, Captain R. A. Warters (I.M.S.), R. D. Whitelaw, P. W. Lamb, C. T. Nam, A. S. Mackie, B. C. D. S. Rupasingha, Captain H. E. Murray (I.M.S.), H. J. J. Garrod, H. E. Variava, O. T. Brosius, J. M. Somasundrum, Captain W. J. S. Ingram (I.M.S.), A. C. A. Fernando, D. Bulos.

* With distinction.

† Awarded the Duncan Medal.

Obituary.

KENNETH MACLEOD, M.D.EDIN., F.R.C.S.ENG., LL.D.ABERD.,

Colonel I.M.S.(ret.); Honorary Physician to the King.

WE regret to announce the death, on December 17th, at Southampton, of Colonel Kenneth Macleod, I.M.S.(ret.). He was born in Trumisgarry manse, in the island of North Uist, one of the Outer Hebrides, in the county of Inverness, on July 23rd, 1840, the eldest son of the Rev. Norman Macleod, minister of that parish. At the early age of 3 he played an involuntary part in a striking episode of Scottish history, for his father was one of the ministers who seceded from the Church of Scotland over the question of patronage, and "went out" in the Disruption of 1843. His father remained in North Uist as minister of the new body, the Free Church. Kenneth was sent to Marischal College, Aberdeen, in 1853, at the age of 13, and graduated there as M.A. in 1857. In the same year he entered on the study of medicine in Edinburgh University, and, after taking first prizes in surgery, medicine, midwifery, and medical jurisprudence, graduated as M.D., with honours, in 1861. For the next three and a half years he served as assistant medical officer in the Durham County Asylum, taking the L.R.C.S.Edin. in 1864; and in February, 1865, when competition for the Indian Medical Service was reopened, after being closed for four and a half years, he passed first for that service, being commissioned as assistant surgeon from April 1st, 1865. Three future directors-general went through the Netley course in the same term: James Cleghorn was second, and Robert Harvey third, for the I.M.S., while Sir William Taylor was among the M.D. men of the term.

His first appointment in India was that of civil surgeon of Jessore, in Bengal, where he served for two years. In October, 1868, he became medical officer of the 6th Bengal Infantry at Jalpaiguri, and in December, 1869, was appointed a member of the Cattle Plague Commission. He had thus had less than four years of the ordinary routine work of officers of the I.M.S., that of regimental medical officer or civil surgeon of a district, and never again served in such posts. In January, 1871, he was appointed secretary to the Inspector-General of Hospitals, I.M.S. (The title of this appointment was changed to surgeon-general in 1873, and to director-general in 1895.) This post he held for eight years, with an interval of fifteen months in 1874–75, when he acted as professor of anatomy in the Calcutta Medical College and second surgeon to the college hospital. He was appointed substantively to this professorship in April, 1879, but on December 31st of the same year was promoted professor of surgery and first surgeon. These posts he retained till he retired on April 15th, 1892. He had reached the rank of brigade surgeon on June 26th, 1888.

After his retirement from the service he was appointed a member of the Medical Board of the India Office, and served in that capacity first under Sir Joseph Fayrer, then under Sir William Hooper, till he was appointed professor of military medicine at the Army Medical School, Netley, on May 29th, 1897. This post he held until the Netley school was closed in 1905, when it was transferred to Millbank. In 1880 he was elected F.R.C.S.Edin.; in 1892 Aberdeen University conferred upon him the honorary degree of LL.D.; in 1900 he was made an honorary F.R.C.S.Eng.; and on May 2nd, 1906, was appointed honorary physician to the King, with the rank of colonel.

In addition to his professional duties, Colonel Macleod found time for a large amount of public work. His service on the Cattle Plague Commission in 1870 has already been mentioned. In 1879 he was appointed consulting health officer of Calcutta, and, after resigning this post in 1884, was in 1885 elected a municipal commissioner for Park Street Ward, the chief European ward of Calcutta. In January, 1880, he founded the Calcutta Medical Society, of which he was afterwards president. He was also at different times president of the Calcutta Public Health Society, vice-president of the Bengal Social Science Association, vice president of the National Indian Association, Bengal Branch, president of a committee to consider the establishment of a veterinary school in Calcutta, and secretary and medical officer of the Martinière schools in Calcutta. After retirement he succeeded Sir Joseph Fayrer as president of the Sanitary Assurance Association in 1894, and was a vice-president of the Medical Graduates' College and Polyclinic.

He took much interest in the affairs of the British Medical Association. He was President of the Section of Tropical Diseases at the Annual Meeting at Ipswich in 1900, and Vice-President of the Southern Branch.

His chief works were: *Manual of Diseases of Cattle*, 1869; *Sanitary Treatment of Epizootics*, 1869; *Report on Medico-Legal Returns of 1868 and 1869*, 1870, expanded into *Medico-Legal Experiences in the Bengal Presidency*, 1875; *History of the Medical Schools of the Bengal Presidency*, 1872; *Report on Establishment of a Veterinary School in Bengal*, 1883; *Operative Surgery in the Calcutta Medical College Hospital*, 1885; articles on Delhi boil and Scrotal elephantiasis in Heath's *Dictionary of Surgery*, 1886; articles on Cholera and Epidemic dropsy in Allbutt's *System of Medicine*, 1896–99; articles on Cholera, Choleraic diarrhoea, Sunstroke, and Epidemic dropsy in *Quain's Dictionary of Medicine* (third edition), 1902; and *Indian Medical Memories*, 1909, originally contributed to the *Caledonian Medical Journal*. He edited the *Indian Medical Gazette* for twenty years, 1871–91, and after his return to this country was a frequent contributor to our columns.

Colonel Macleod was twice married, first in 1865 to Jamima Isabella MacDonald, who died in 1874. She had two sons, both of whom died in infancy, and three daughters. In 1877 he married Jane Christie Aitken, who had three daughters and four sons. One son served in Paget's Horse in the South African war, and three in the war of 1914–18: Commander Kenneth Macleod, R.N., Major Torquil Macleod, R.A., and Lieutenant Alastair Macleod, 1/5 Hampshire Regiment. Major Macleod was severely wounded at Contalmaison in July, 1916, and on rejoining duty, after a long stay in hospital, was sent to Palestine, and on the way out was twice torpedoed in one day, near Alexandria. A grandson, Lieutenant Kenneth Carnduff, R.E., was killed in France on January 12th, 1916.

Colonel Macleod was a man of fine stature and physique. Only a man of perfect physical health and strong constitution could have got through the immense amount of work, professional and public, which he did for twenty years in Calcutta. He was a bold and skilful surgeon, and for many years had a large private practice in Calcutta in addition to his work in the medical college hospital and the duties of his chair. He was somewhat brusque in manner, and did not suffer fools gladly. But he was a good friend, officially and privately, to junior officers who served under him, and in all respects was an excellent representative of the great service in which he served so long.

R. J. RYLE, M.A., M.D.OXON.

DR. REGINALD JOHN RYLE, who died on December 4th, aged 68, was the son of the late Bishop of Liverpool and a brother of Bishop Ryle, Dean of Westminster. He was educated at Repton School and Trinity College, Oxford, and received his medical training at Guy's Hospital Medical School. He graduated B.A.Oxon. in 1877, M.A., M.B. in 1884, and M.D. in 1894, and took the diploma of M.R.C.S. in 1883. After practising at Barnet for some ten years he removed to Brighton, where he continued to practise until recently, when he retired and went to live near Pangbourne. Dr. Ryle took great interest in local public affairs and social service. He served for two years as the representative of the Pier Ward on the Brighton Town Council; he felt compelled to resign his seat owing to his inability to give to the work the time and attention which he considered it should receive. He was a justice of the peace for the county borough of Brighton, and his professional knowledge was of great assistance to the Bench. He married in 1885 the daughter of Mr. S. K. Scott, surgeon, of Brighton, and a member of a well-known medical family. He leaves five sons, one of whom is now assistant physician at Guy's Hospital, and five daughters.

Dr. Ryle's interest in social medicine was shown in many ways. He had, for example, studied closely the question of feeble-mindedness, and to the conference held at Brighton in 1911 under the auspices of the Association for the Feeble-minded he read a paper on the origin of feeble-mindedness, an abstract of which was published in our columns at the time; subsequently the full text appeared in the report of the Conference. At the Annual Meeting of the British Medical Association in Brighton in 1913 he was President of the Section of Medical Sociology. In a brief address he adopted the definition of sociology that it is "the scientific study of society and of all the phenomena it exhibits, including the various forces and processes at work within and upon it."

We are indebted to Dr. L. A. PARRY of Brighton for the following brief tribute: The profession has sustained a great loss by the death of Dr. R. J. Ryle. We in Brighton, where he practised for so many years, especially feel this, for we knew him well as a man absolutely upright and straightforward, one who always thought of the good of others rather than of his own. His professional, scientific, public, and social work were all of the highest character. Whatever he did, he did well, and with the sole object of doing his best for others. We have lost a good man and a good friend. We could always rely on his advice and assistance in any matter, and we knew it would be freely and willingly given.

JOHN MAGEE FINNY, M.D.,

Consulting Physician, Sir Patrick Dun's Hospital, Dublin.

DR. JOHN MAGEE FINNY, formerly of 36, Merrion Square, Dublin, passed away at his residence, Erith Lodge, Sandymount, on December 7th, at the age of 81, and was interred at Mount Jerome Cemetery, Dublin, after a service in Christ Church, Leeson Park, where he had been a member of the congregation for over fifty years.

Dr. Finny was a distinguished scholar of Dublin University; in 1864 he obtained the medical scholarship and became the senior exhibitioner, and also took the M.B. degree. In 1868 he became a Fellow of the Royal College of Physicians of Ireland, of which he was elected President, 1890 to 1892. In 1882 he was appointed King's Professor of Medicine in Trinity College, Dublin, and physician to Sir Patrick Dun's Hospital, where his teaching of medicine attracted large numbers of pupils to his lectures and his clinics. He was chairman of the Academy of Medicine, consulting physician to Mercer's Hospital, Dublin, member of the Senate of Trinity College, Dublin, and a member of the Board of Superintendence of the Dublin Hospitals, and H.M. Visitor in Lunacy. He was also for a considerable time an examiner in medicine at the army medical examinations in London.

Dr. Finny was a son of Rev. Thomas Henry Cotter Finny of Cork, by his second wife, Frances, daughter of William Magee, D.D., Archbishop of Dublin, and grandson of William Finny, Commissary-General for Ireland. He leaves a widow and four sons, two of whom are members of the medical profession.

THE late Professor J. K. A. Wertheim Salomonson has bequeathed his instruments and books on medical electricity and roentgenology to the University of Amsterdam.

Medical News.

THE annual dinner of the Royal College of Physicians of Edinburgh will be held in the Hall of the College on January 26th, 1923.

THE first two ceremonies in honour of Pasteur's centenary will be held in Paris on December 26th at the Académie de Médecine, and on December 27th at the Institut Pasteur, when there will be an exhibition of the instruments and apparatus used by Pasteur. The French Government has decided to issue an international stamp bearing a portrait of Pasteur.

THE annual dinner of the Epsomian Club was held at the Trocadero Restaurant, London, on December 14th, with Dr. H. F. Ealand in the chair. In proposing the toast of "Floreat Epsomia," Dr. Ealand, in the course of a witty speech, remarked that to his mind the disadvantage of Epsom was that it had been a "class" school, in that most of the boys—in his time, at least—were sons of doctors. He hoped that in future this would not be so, and that the boys would come from every walk in life. After the school song had been sung with much enthusiasm, Mr. Powell, the new headmaster, gave a brief review of the school's activities. A new chemical laboratory was in course of preparation, and work upon the chapel—the war memorial—was to begin as soon as possible. The school had had eleven successes in the first medical professional examination, and the sports successes had also been notable. Mr. Powell emphasized the place in the body corporate that the old boys held, and invited them to make more use of the playing fields. The toast of "The Visitors" was proposed by Mr. Mackay, and Lord Dawson of Penn, in responding, made a plea for the broadening of interests at Epsom. The medical profession, he said, had not had that influence upon the general culture that it ought to have had. The health of the new headmaster was proposed by Dr. Stillwell, and that of the chairman by Mr. Maynard Smith.

AT the social evening of the Royal Society of Medicine on December 13th a wireless concert was given. It was arranged by the Electric Light Insurance and Maintenance Company and the society's electricians, in conjunction with the Marconi Company. The President, Sir William Hale-White, in addressing the large company which had assembled in the Robert Barnes Hall, said that the music would be received from the London broadcasting station in the Strand a mile away. The music was quite clearly heard, and the demonstration was much appreciated. A vote of thanks to those who had taken the pains to arrange the concert and to the Marconi operator was passed by acclamation. Afterwards Dr. Arnold Chaplin gave a short lecture on engraved portraits of medical men, a subject upon which he is one of the chief living authorities in this country.

A COURSE of twelve lectures on the management and feeding of infants and young children will be given by Dr. Eric Pritchard (medical director of the hospital) to qualified practitioners, at the Infants' Hospital, Vincent Square, S.W., at 6 o'clock on Mondays and Thursdays from January 15th to February 22nd, 1923. Further information may be had from the secretary of the hospital.

THE Women Sanitary Inspectors' and Health Visitors' Association is holding its second winter school for health visitors and school nurses at King's College, Strand, W.C., from December 28th to January 11th, when a course of lectures will be given by Lady Barrett, Dr. Eric Pritchard, Dr. A. F. Tredgold, and others. The full programme of lectures may be obtained from the secretary of the Association, 5, York Buildings, Adelphi, W.C.2.

THE annual report of the Officers' Families' Fund shows that valuable work continues to be done by this organization, particularly in connexion with education. During the past year the committee dealt with 3,338 new applications and 2,516 renewed applications for assistance, and over £17,800 was distributed in grants and loans.

A SPECIAL intensive post-graduate course in cardiology will be given at the National Hospital for Diseases of the Heart, Westmoreland Street, W.1, from January 8th to January 20th, 1923, inclusive. The fee for the course is £7 7s. Inquiries should be addressed to the Dean at the hospital. Further particulars will be found in our advertisement pages.

THE Walker-Gordon Laboratories were established twenty-seven years ago chiefly for the purpose of preparing modified milk on prescription, and the supply of unpasteurized cream of any desired percentage of butter fat. The company ceased its operations during the war (1916); it has now re-established its farm, and its offices at 54, Weymouth Street, London, W.1.

THE French medical journal, *Progrès médical*, founded by Dr. Bourneville, has recently celebrated its fiftieth anniversary.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

"P." pays £95 a year interest on money borrowed to buy a practice.

*** If the interest is paid to a bank the amount can be deducted as a professional expense, otherwise "P." is entitled to deduct tax at the standard rate from the interest as and when he pays it, and must include the interest in the profits on which he pays tax.

"S. J. H." replaced a second-hand Ford car by a new car costing £445. The inspector has allowed £150, the estimated cost of replacing the Ford car by a similar one, less £30 deducted therefrom for private use of the car.

*** So far as the £150 is concerned the inspector seems to be right; the additional expenditure was incurred in the improvement of the professional equipment and not in its mere maintenance. If the private use of the car shortened its working life so far as "S. J. H." was concerned, or reduced the amount allowed to him when he sold it, some deduction is reasonable, but unless it has been used in that way more than is ordinarily the case we doubt whether that use would have increased at all the expense incurred in replacing it, and in that case the full £150 should be allowed. Our correspondent has a right of appeal to the District Commissioners or to the Commissioners for Special Purposes from the inspector's decision.

"X. Y." purchased in 1914 a Wolseley landaulette for £600, supplementing it in 1916 with an 8-h.p. Renault costing £300. In 1922 the former was sold for £280 and the latter for £150, and a 11.9-h.p. Calcott coupé purchased for £595.

*** We advise our correspondent to regard the Calcott car as a replacement of the Wolseley and to claim £595 – £280 = £315 as a professional expense of the year 1922. When he purchases a second car he will have a valid claim to the allowance of the cost thereof up to a maximum of £300 – £150 = £150 as a replacement of the Renault.

LETTERS, NOTES, ETC.

THE PAST, PRESENT AND FUTURE OF MIDWIFERY.

DR. C. LUNDIE (Thaba 'Nchu, O.F.S., South Africa) writes: After reading Professor Watson's excellent inaugural address at Edinburgh University (BRITISH MEDICAL JOURNAL, October 21st, p. 712), it occurs to me that in order to attain to his very lofty and praiseworthy ideals in midwifery a very drastic change in the present methods is necessary, the chief thing to be done being intensive organization and team work among members of the profession. The various branches of the profession have become such wide subjects in themselves that specialization is essential, yet few who can afford an ordinary medical curriculum can afford the further expense and delay in earning power involved in a specialist's course after taking the ordinary medical degree. Hence there are not enough specialists to go round if every one is to have their aid within their means, yet there is an immense superfluity of general practitioners, many of whom find it difficult to make a living.

The only reasonable hope of providing efficient service to all, rich and poor, and at the same time using all the qualified men to the full seems to be a modified form of state medical service, which it should not be beyond the genius of man to evolve free from the numerous objections to it that have been pointed out at different times. The newly qualified men would have to serve a sort of apprenticeship in the hospitals and later in general practice under supervision of older and more experienced men. Patients would be allowed to choose their doctors, and fees according to the means of the patients would be collected by the State and salaries proportionate to the amount and nature of the work done paid to the doctor, who would be promoted for efficiency to higher grades of work and so to higher rates of fees. There would thus be no resting on one's oars when one got to a high rank because the salary would depend on the amount of work done as well as on the rank attained—specialist general practitioner or professor. Only by some such scheme, which would have to be introduced gradually, can proper team work be organized in the profession. Facilities for specialization and further study would be provided for the keen and ambitious.

RADICAL PREVENTION OF VENEREAL DISEASE.

MISS ETTIE ROUT (London, W.), in the course of a letter on this subject, writes: Dr. Gerald Garry's letter from Cairo regarding the outbreaks of venereal disease there in the early days of the war should be read in conjunction with the opinions expressed by Colonel Sir James Barrett, the first A.D.M.S. of the Australian Forces in Egypt then (1915), and later on his return to Egypt after sick leave (1916–1917–1918). Dr. Garry says "there is but one way of dealing with such diseases"—isolation and segregation. These measures are necessary but in themselves of proved insufficiency, even when properly administered. The evil of venereal disease cannot be greatly lessened until all the factors of reduction are brought into play—ethical, social, legal, and medical; to argue in favour of a cure-all is not medicine but quackery. Nor can any headway be made with any sex problem till both men and women turn their minds upon it cleanly and strongly. To state, as Dr. Garry does, that moral platitudes should be ruled out of medical practice is clean and logical; to say immediately afterwards that "Perhaps not the least regrettable fact in connexion with this unsavoury controversy is the prominent part taken in it by women," is unclean and illogical. The fact is that women must step out of their almost incredible ignorance and prejudice, and men must learn to de-Orientalize and dis-Turk their minds. . . . Those who have studied the venereal problem most carefully—historically and personally—know that a prime factor in its solution is the engagement of women's minds and hearts in this very dreadful affliction of modern society—for which women as well as men are responsible. A day will come when all women of courage and sympathy will freely give their services in the great cause of sexual health, but that day will not be hastened by snubbing their early endeavours to gain the knowledge and experience necessary to qualify them as efficient social health workers.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

DR. F. W. COLLINGWOOD (London) writes: It seems strange that the Council and Fellows of the Royal College of Surgeons of England should wish to retain rights under a charter granted in 1843, which at the present time are utterly inconsistent with the spirit of the age in which we live. After the annual meeting a member of the press was surprised and could not realize the attitude of the Council towards the request of the Members to participate in the administration of the College. I do trust that the British Medical Association will show sympathy and take steps to induce the Privy Council to amend the charter of the College and bring its constitution into keeping with the atmosphere of the present day.

A NEW SUBSTITUTE FOR SALVARSAN.

BOOTS PURE DRUG CO., LTD., of Nottingham, inform us that the Ministry of Health has approved of their preparation "Stabilarsan" being placed upon the list of approved substitutes for salvarsan. "Stabilarsan" is stated to be a chemical compound of salvarsan—the original diaminodihydroxyarsenobenzene, not neo-salvarsan—and glucose. It is prepared in solution ready for immediate use, and can be given either intravenously or intramuscularly.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 32, 33, 35, and 36 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 34 and 35.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *232*.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page) ...	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *post restante* letters addressed either in initials or numbers.